

MODEL AIRPLANE NEWS

JULY 1952 - 25 CENTS



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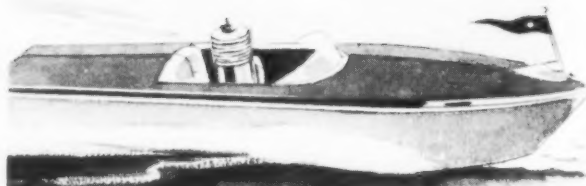
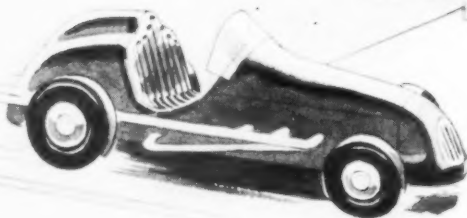
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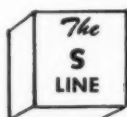


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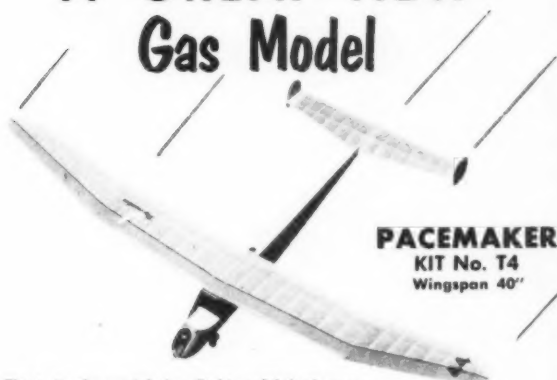


S-7—GRUMMAN PANTHER F9F S-8—SABRE JET F86E S-9—THUNDERJET F84



S-10—MIG 15 S-11—McDONNELL VOODOO F88 S-12—MUSTANG F51

A GREAT NEW Gas Model

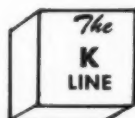


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K4—MUSTANG F51 K5—SABRE JET F86D K6—THUNDERJET F84

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MODEL AIRPLANE NEWS

Serving Aviation 23 Years

JULY 1952

VOL. XLVII-No. 1

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by
William
Winter

► Having just heard a waiter in a hamburger joint explain to a customer why coffee cake with holes in the middle doesn't sell as well as cake that is 100 per cent wing area, we are about to explain what it feels like to be a professional. Ted Clodius, promotion manager of the New York Mirror, showed us a list of tainted amateurs who have entered the Mirror Meet, and there was M.A.N. at Work, as big as life. This makes us an authority, although we always understood it was a certain upstater friend of ours that the speed boys would like eliminated. How does it feel to be termed pro?

► It strikes us funny. Really. Never win anything unless some guy sneaky flies one of our ships, and then we get a bag of blocks or a trophy of a trophy. Thanks for the flattery, fellows! Some of the other names on the pro list have less potential than the spectators. Now assuming that McElwee and ten other r.c. entrants each have four flats on the way to the contest so that a "pro" should win, what then? Frankly, we'd feel like one of the Scragg boys to cart away a prize. It would be fun to win but what possible satisfaction beyond that would be added by a chunk of merchandise? When the day comes that we would pop a gasket to get a television set, Bill Brown Jr. should unmake the first gas motor. Say what you want about the Wakefield boys, but they prize that well worn trophy more than anything in the world. That's the way it should be. Before the lines break we hasten to go on record as agreeing with the Mirror, in our own case, but do hedge in allowing that some innocent people always get hurt when a policy of any kind is established, by anyone, anywhere.

► Some of the frustrated soap box operators who crowd this act, have set up a new event. This consists of badgering the Mirror, Plymouth, and others who put stacks of trophies and money on the line. It isn't Plymouth or the Mirror that places a false value on things. It is we modelers. For years the veteran contest goers case the prize lists. If they are not assured—

and it amounts to being insured by reason of the numbers of prizes relative to entrants, among whom the expert is sure fire—of a fat prize they do not condescend to drive 50 miles. Phoeey.

We have seen contests where the trophies outnumbered the entrants, where, consequently, every entrant received an award. Contests where the trophies outdid in magnificence the great trophies of sports, where prestige has made them world renowned. Contests where trophies had to be taken apart in order for a little shaver and his helper to portage home the hardware. Give us back the famed name trophies of old and the will to win them that made competition real fun. When we have to be coaxed to fly, lured to contests by visible and almost certain rewards, we contest going modelers are a sad lot. We would like to see some club put up a Nationals trophy made out of an old coffee pot, soldered together tin cans, or anything else that is handy and is worth less than a nickel. The rubber boys have the guts to do it.

► At a Wings Club luncheon the other day, a group told Lt. Cmdr. John Burton what a swell job he had done, in representing the Navy, for American modeling. Lt. Cmdr. Eddy, who took over when John left for Tokyo, is another keen operator. Whoever appoints these men certainly has the interests of air youth at heart. With Eddy on the right, and Cal Smith, first winner of the Nationals carrier event on the other, a lively discussion on ways and means to popularize the event on the local level took place. Lo and behold, if Eddy didn't follow up with a book-length letter, photographs, and diagrams for a simple set-up to make possible a carrier event at smaller contests. This important material was speedily turned over to Jim Saftig for further expert commentary.

► Now that spring is here, weather is worse than during the winter. We can't fly every weekend. Gales and rain storms about 50 per cent of the missions. Missed one weekend all winter but now it is (Continued on page 8)

MODEL AIRPLANE NEWS • July, 1952



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Scrap ... Box

by Jim Saftig

When old Sol starts the thermals bubbling and the contest circuit gets to rocking, anything can happen.

Reliable stooge set-up is essential for good team racing events. This arrangement was used by San Diego Airliners.

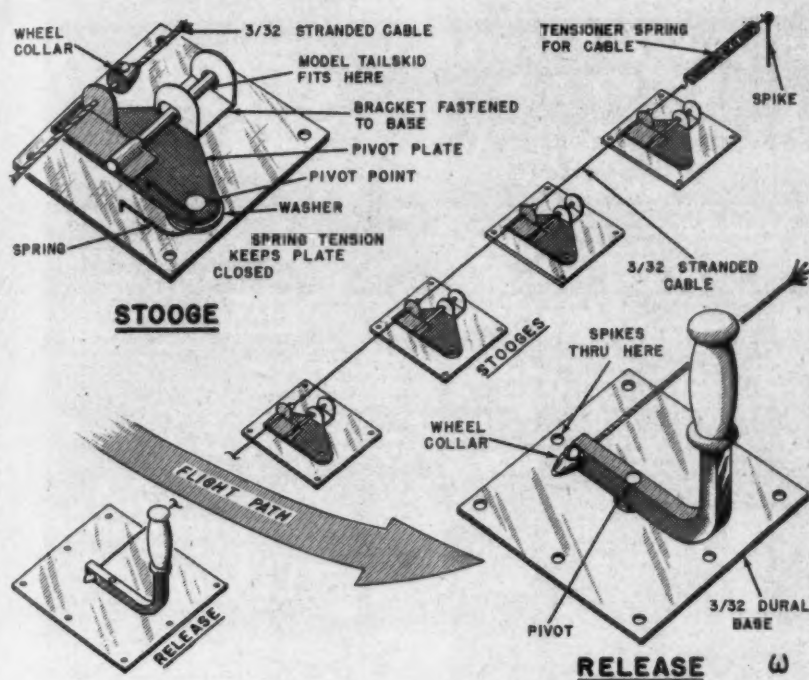
► Mr. P. A. A. Dummy, the little man with the lead in the lower regions, is giving us modelers plenty to think about. Visions of hundred dollar bills and Bulova watches are turning the heads of the die hards, yet to compete in this event. P.A.A. brings us a mouth-watering group of events. Remember talking to Dallas Sherman in 1948 about AA engines. Discussed weight and thought in terms of one or two ozs. Three or four ozs.? Who're you kidding? And now? A little lead-fanned man of four ozs. plus a cargo! The ships get into the air, load and all, engine cuts, they fly and land. Bellies are bulging, but the crates hold together.

You "rubber stretchers" aren't out on a limb. Check in at the '52 Nat's with a rubber powered P.A.A.'er (just for kicks) and let's see what the test crates do. Don't forget the two oz. dummy. Berkeley's Payloader encloses a 5/8 oz. dummy. This model might give you a few ideas.

There will be no sponsorship this year for rubber or flying scale pay load events. Takes time before proceeding with rule changes and new classifications. Maybe the scale event per aspect ratio, or general looseness in other phases will cause a grumble, but let's not bite the extended hand. Gripe and comment—constructively. Pan American is doing an excellent job, let's do the same.

Rubber power. Rules here are simple! A bit long because rules allow no use of tricky devices or excessive sizes that would make the event complicated and expensive. A.M.A. rules apply! Brief rules: Power—rubber and single unit "motor" only; Size—not longer

than 18" from inside face of prop hub to inside face of hook at opposite end; Motor completely enclosed; ball, or any other type, propeller shaft bearing plus lube can be used. Multiple unit motor, gearing in motor, and any type auxiliary power is "nixed." Single prop only—maximum size 10" in diameter. It must have two or more blades of fixed type. Free-wheeling okay. Single blade or folding type—nope! Model must be fixed-wing airplane type: monoplane, biplane, tailless, canard, etc. Span of wing plus stab can't be over 48". If they are separate, span of stab can't be over half the span of wing. If surfaces of frame and covered type, they must be covered on both sides. You can use solid surfaces but not single covered ones or rotating lifting surfaces. For gear you can use wheel bearings, pants, or spats. Even partially buried-in wheels. Nix on the single wheel or retractable gear. Occupant can be larger and heavier but not smaller or lighter. Can't use the occupant in any manner that will influence flight of model, except for weight and balance. The occupant can't be used to contain or support any part of the model or accessories. Occupant has to be upright and face forward in enclosed compartment. Total depth of fuse at payload area shall not be less than 3". Simulated visibility must be provided through transparent areas at least 3/4" high "looking" to front and both sides from head of occupant. Cabin and bubble canopy okay. No open cockpit. All right to stretch motor outside of enclosure for winding. One assistant may help with a mechanical winding device. Model must R.O.G. unassisted. Flying



and timing per A.M.A. except minimum flight time for an "official" shall be 15 secs. This is the general idea of the proposed PAA-LOAD EVENT rules and specs for Rubber Powered outdoor type model airplanes.

Clipper Cargo (dummy plus cargo) invites design enlargement and refinement per engine power and of basic rules. The field is expanding as are loads carried. The events are extremely new but modelers have jumped in with both feet.

The "big" meets are being lined up. The 5th Plymouth Internationals and the Nat's in California are targets for this year's big competition. Per Plymouth Harold Queen has things lined up as Contest Chairman in Minnesota. Enjoyed their rundown on the 26 clubs which will open in the Twin Cities this year. Experienced builders are needed for instructors. Prospects should contact Mrs. Billie Logan, Secy., Pals Clubs of Minnesota, 1586 University, St Paul. Pal Clubs are branching out. We need them so let's push. Never had such co-ordinated efforts to further the youngsters' building and flying knowledge per P.A.L. Elementary procedures furthered such as: sand papering, cementing, safety precautions, etc. Course—30 weeks. Excellent from beginning to end. The kids and oldsters love it.

The Aero Nuts of New York have new officers: Sid November, President; Gary Garab, Vice-President; Frank Santore, Treasurer. This gang centered activity in F.F. and R.C. U-control? Events flown in U.C. to liven up the

part of the year in which F.F. drops dead. Looks like the oil and water are mixing well here. Should be more of it.

Got a chuckle listening to a beef about engine knowledge. F.F. iron man vs. U.C. hardhead. F.F., "You guys didn't even know engines existed till we started using them. You abuse them and fill them with the stinkiest conglomerations of fuels we've ever smelled." Comeback, "You hill and dale chasers don't run your engines, you weight them down with clubs and let them idle. All you get is a sour run and a stack full of carbon. Engines were crummy till we started running the heck out of them, and for more than a sad 20 secs. Half of you characters wouldn't know a clean two cycle if you heard it." Fact is, U.C. had the manufacturers scratching up the dandruff. Speed jobs started it, then development for stunt ships, team racers, and on and on. Lots of speed, low fuel consumption, clean runs, feather adjustment—what else? Finally everything had to be combined into one engine. Who did it? Mac, Dooling, Torp, Fox, and etc. F.F. and U.C., you're all wrapped up in the same engines and more records are being set in both classes. So what's the beef? There ain't none.

Arthur Godfrey has stirred things up in the South. Down Georgia way there's a \$500 perpetual trophy up for annual competition. Arthur did it. Here's the way it works. The Donor-Sponsor Committee has worked out a unique plan for determining each year's winner. For the year (Continued on page 36)

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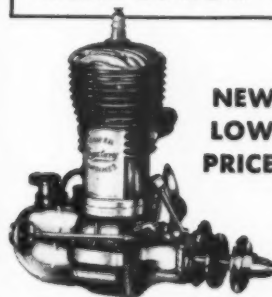
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M. A. N. at Work

(Continued from page 2)

catch as catch can. Have lots of fun with the original Windy Joe, which does beautifully on the combination of the E.D. 2.46 (seven ether, seven kerosene, five castor) and Lorenz's two-tuber. (Future issue, rc'ers., so relax!) Recent ground check showed drop to half-tenth 900 feet off the end of antenna on less than four watts input. Have learned that you can reach a point in forward trim, in connection with shallow dihedral (about six degrees) where the plane will maintain a 360 right or left after rudder is applied and returned quickly to neutral. Ship then climbs very slightly in the left turn and dives a trifle in the right turn and will break out of the climbing turn more quickly than out of the slight dive turn. Noted a slight mush and placed a pencil in nose for ballast. Mush increased. Added another battery in nose. More mush. Another battery, mush, still another battery, and now the ship began to stall. So they tell you that planes become nose heavy by adding weight in the nose. There is an answer. Do you know it?

▶ With r.c. the rage, it is tough to keep interests on an even keel. With so many male members in the family, the problem is simple for M.A.N. at Work. Like Tom Sawyer white washing the fence. Any kit can be matched up with proper age modeler. Then we join the flying session. After a Saturday morning bout with stunts and trainers on lines—wounded fingers from starting assorted engines (all they let us do)—we then stagger out to the usual r.c. session. Repeat on Sunday and, brother—you have had it!

▶ Speaking of r.c. reminds us of a flier who lives near the Jamaica race track. He has a Rockwood set and uses ear phones for checking. During a race he heard a female voice reciting numbers, over and over. Ah! Somebody was beating the bookies. But it was only a doctor's phone answering service. You know, rubber was never like this.

▶ Robert C. Strobell, Associate Curator of the Smithsonian, is excited over Bob Hare's article (and Nieto's drawings) of the Curtiss Racer. Mr. Strobell said we neglected to mention that the plane can be seen in the Smithsonian. Wonder if this throws those twin experts off the track, but the Curtiss was given to the Institute in 1927 by the War Department. It was the R3C-1 but the Institute made it into the R3C-2 for exhibition purposes. (We should have kept this secret and given Hare and Nieto an argument!) Mr. Strobell should know what really went on. Old Joe was up against a deadline, down there in San Antonio, and no one had dope on the color scheme and markings.

▶ Receiving Joe's desperate wire for help, M.A.N. wired the Institute. Then got the bright idea of phoning the AMA's Russ-I-Tackle-Anything Nichols. Russ phones the Smithsonian. Someone goes out on the floor and makes notes. Phone call to New York (not out of AMA funds either!), phone call to Texas, and now you can turn out an accurate job from those drawings. While this sort of thing goes on all the time, all up and down the line, you will be interested in more of the behind-the-scenes-with-Nieto stuff. Take the Fokker Triplane. Did you know that an accurate plan has never been done? Early drawings were out, so all subsequent copies also were all wet. Joe has been weeks doing such things as reassembling old machine gun parts to understand the Spandau action, measuring old parts in his collection, and filling in completely forgotten data and measurements that have never before come to light. Secrets of the control system, rib spacing, and a host of other mysteries have been cleared up. Joe had even corresponded at one time with the late Captain Roy Brown, the man who is credited with shooting down the Red Knight of Germany, pilot of the Tripe shown in the drawings.

▶ That you find M.A.N. at Work in the usual
(Continued on page 55)

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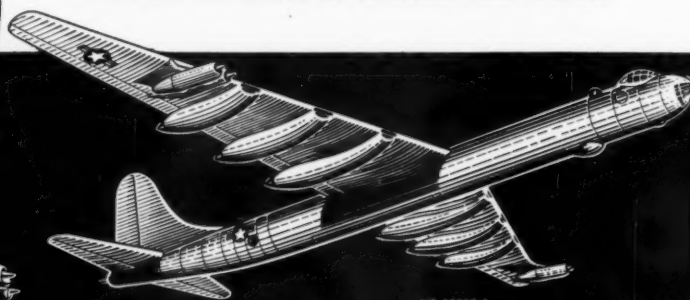
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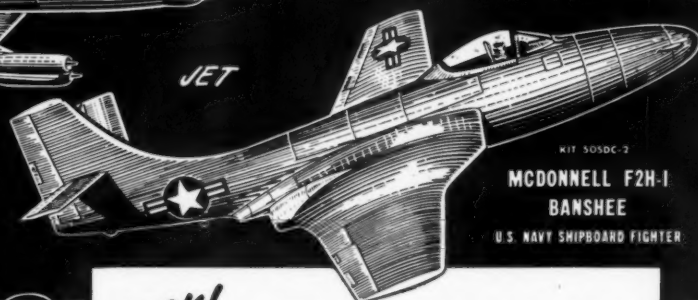
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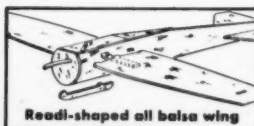
A NEW TRIXTER GAS MODEL



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SPEED TRAINER AND SPORT FLYER**



Fuselage molded to shape



Ready-shaped all balsa wing

COMPLETELY PRE-FABRICATED

Wing span • 12 in.
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Lou Andrews

says: "TINY flies out of the palm of your hand"

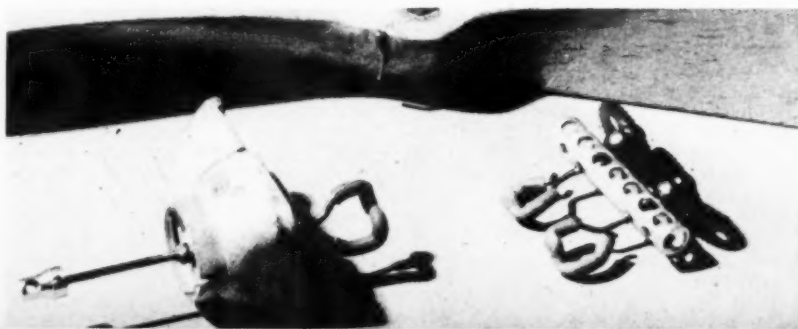


Sune Stark with the model whose consistency in all three rounds of Finnish finals proved his emphasis on simplicity, reliability, correct approach.

The World's Top Rubber Job

by SUNE STARK

This exclusive article reveals the ideas that enabled the author to win the 1951 Wakefield. Featured were simplicity and return gears.



► At the 1950 Wakefield contest in Finland, it was for the first time possible to see what the best Wakefield models could really perform, because of the calm and thermal-free weather conditions. I found that, in spite of the fact that I had good luck with all my starts and that my model performed its best, I had no chance in the top fight and placed number 12. I then decided to build a model that was remarkably better for next year's contest and, as you know, I was successful in that. Certainly I was as surprised as many of my fellow-competitors that I won the cup, but I did know that my model was good enough for a place near the top.

As you can see from the plan, my 1951 Wakefield model is a very simple and clean design. I made it so, not only because it was easy to build, but also, because I think simplicity is a characteristic property of a good contest model. In the following I will try to give you some of the basic ideas behind my model.

It is obvious that a low total weight is essential for the gliding performance of a duration model. For good climbing performance you want a low weight but also much rubber to turn the propeller. Much rubber means much power but also much weight,



Great stress was laid upon the proper relationship of wing and tail areas and the wing position. The airfoil was newly developed in wind tunnel tests.

and I think one of the most difficult questions in model airplane design is to choose the right amount of rubber weight. I use a rule of thumb that says that the rubber weight should not be less than 50 percent of the total weight.

However a good duration model is always characterized by a low weight of structure. My opinion is that, in most cases, it is of no use to improve the aerodynamic shape of the model to get less drag if it costs structure weight. Therefore I think that a very simple, slabsided model is best, because you can build it lighter than any other design. At the same time it is also easy to build and to repair. The following weight list for my model may be of interest. Wing—30 grams; Fuselage and land gear—28; Tailplane—10; Propeller with bearings—22; Gears—10; Rubber—130; Total weight—240. (Editor's Note—28.349 grams equal one ounce).

As there probably is better balsa wood and tissue in the U. S. than in Sweden you can easily build it lighter than that.

Another very important consideration is how to arrange the rubber motor to get the best performance out of it. The first question is here to choose a suitable cross area of the rubber motor. For a Wakefield model I think this area will normally vary between 70 and 100 mm². I use 14 strands 6x1 mm² Dunlop Black rubber which gives a cross area of 84 mm². (Editor's Note—one inch equals 0.0254 meter.)

The second question is how to build this motor in the model. If you want to use only one motor, you will find that you need a very long fuselage to get the motor stretched between the hooks when unwound. The new Wakefield rules permit unlimited long fuselages and some members of the 1951 U. S. Wakefield team used that type. These models showed a very flat and nice glide, so I think that system could be as good as any other. When designing my model, I did not choose that method for the following two reasons. A very long fuselage means more weight and higher moment of inertia compared with a normal design. The high moment of inertia can cause stability troubles and I did not want additional weight.

As you all know it is possible to use a long motor and

A boxy looking, but formidable design, resulted from belief that improved aerodynamic shape is worthless if it costs more weight.



a short distance between the hooks if you use a special method of entwining the motor in order to keep it stretched between the hooks when unwound. I used that system on my 1949 and 1950 Wakefield designs. That is indeed a very simple solution of the problem, but I was not quite satisfied with it because I found that small c.g. movements would occur from flight to flight.

I decided at last to try the return gear system because it has none of the above demerits, and because it had several times turned out to work very well in Sweden, where it has been used since 15 years. Gears of course cost weight which is a particular disadvantage if they are situated in the rear part of the fuselage. I tried to build them as light as possible and the result was 10 grams. I think I have to be satisfied with that.

The airfoil section was developed as a graduate work by two students at the Royal Institute of Technology in Stockholm. That work included a lot of theoretical calculations and wind-tunnel testing. For the latter purpose, they built a special two-dimensional wind-tunnel with a very low turbulence level. Because developing a model airplane section is essentially a question of avoiding laminar separation of the boundary layer at low Reynolds' numbers, it is of course very important that the wind-tunnel be practically

(Continued on page 41)

[illegible]

WAKEFIELD WINNER 1951
by
SUNE STARK
Stockholm Sweden.

All measures in millimetres.

Scale	0	2	4	6	8	10	15	20	30	40	50 cm/s
Scale	0	2	4	6	8	10	15	20	30	40	50 cm/s



First prize (\$10) for workmanship goes to Larry Simmons North American P-51 Mustang. Picture was taken at Tangerine Internationals, in Florida.



Second place subscription prize to Knut Hagen, Norway, for outstanding job on blown-up .19 engined version of DeBolt's Live Wire.



Fokker D-7 takes third place subscription prize for R. Haack, of San Antonio, Texas. Built to 1" equals 1', is K & B Torp powered.

Air Ways

Come heck or high water, M.A.N. readers in all walks of life keep turning out interesting jobs.



Fun at the shore. Charles Bennett, Baltimore, put this Cleveland Play Boy Sr. on floats with Ohlsson 60. Ship is eight years old.



Red-and-yellow seven foot Super Cruiser was outfitted with Aero-tral radio by Bill Paterson, Vineland, N. J. An ignition Ohlsson 60.

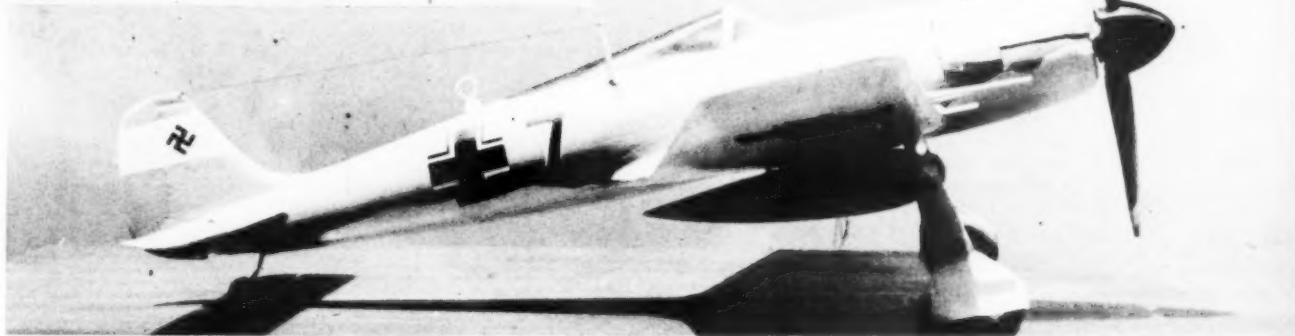
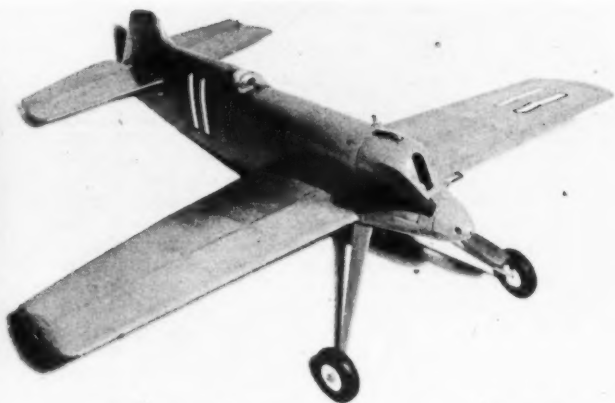


Top, left—Throttle controlled Forester 99, Nieuport 28 enables Bob Sherwood, Syracuse, N. Y. to tow Waco glider, holding line in each hand.

Above—One of the many successful Drakes turned out from M.A.N. plans is this neat Wasp-powered craft, by Don Helfer, of Tillamook, Oregon.

Left—Dick Crandall, Detroit, turned out neat 85 sq. in. team racer, using 1.5cc Javelin diesel. Span is 22½ inches, and weight 6½ inches.

Below—From distant Djakarta, Indonesia, Tien Yu Ho (Chinese) sent pic of Focke Wulf 190 a 35 in. ukie, weighing 13.10 ounces. Mills 1.3cc.



Semi-scale biplane, constructed by R. McIvor, span of 36 inches. Shot taken by N. Orbourn. Both chaps live in Ireland. Mills 1.3cc.

Rockets, landing lights, detailed cockpit, this Hawker Typhoon, by Flight Sgt. D. G. Prentree, RCAF, Clinton, Ontario, Canada, has everything.



the Snapper

by

HAROLD
REINHARDT

**Small engine fans with yen
to stunt should run, not walk, to
nearest hobby shop for balsa, cement,
to make this wild and woolly plane.**



Author with the Snapper, one of the hottest AA's concocted.

► In the past, there have been a lot of airplanes with very simple construction, but with such construction, performance usually has been sacrificed. So, about eight months ago, I set out to design an airplane that combined simple construction, performance and strength. The airplane presented here is the final result of those efforts.

A new theory was tried on this airplane. Everybody knows that an airplane with dihedral is more stable. Since a stunt ship has to fly through outside as well as inside maneuvers, extreme dihedral seemed impractical, so the airplane was designed to have bending wings, giving it dihedral in all positions.

Sheet balsa construction made this possible. The wing will flex upward under a looping load, or downward under an outside loop loading. While this is spectacular to look at—so those on the outside of the circle have told me—there is absolutely no danger of the wings folding.

Construction is almost self-explanatory. Start by cutting all the parts from plans. Sand wing and tail assemblies,

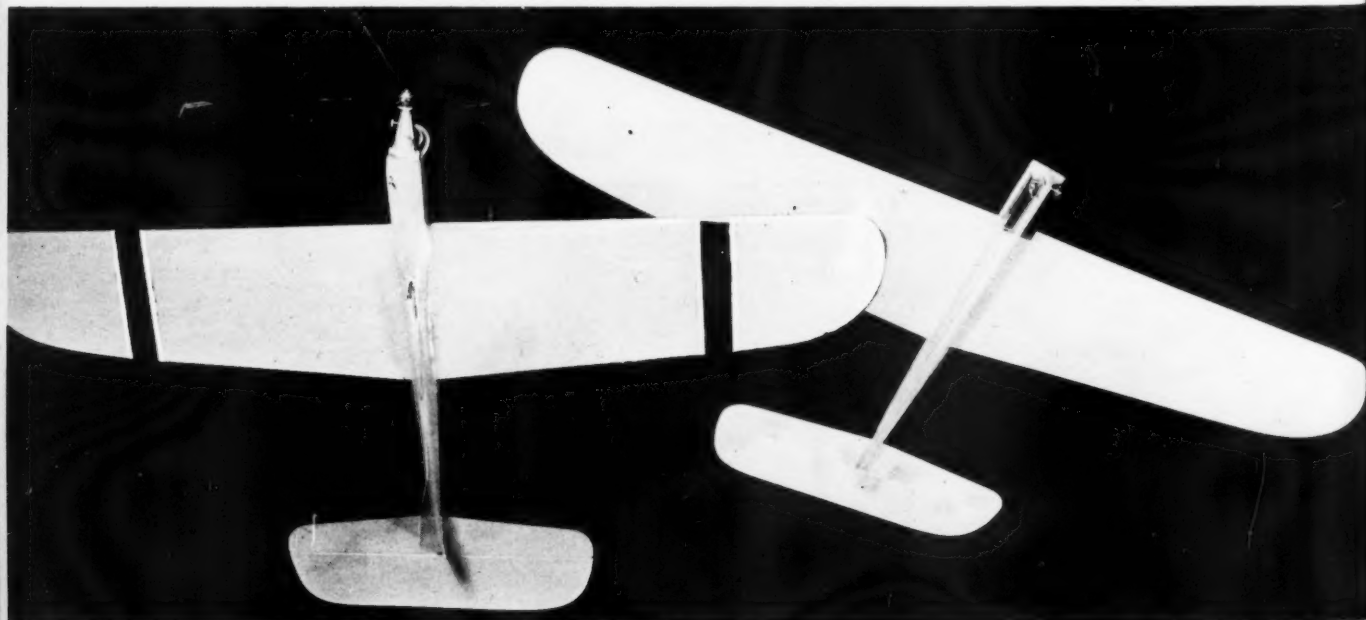
and cement the elevator hinges in place. Make or buy a suitable tank and mount it on the fuselage bottom. Add the wing and tail assemblies, and add the fuselage vertical keel. Cement the mounting nuts to the back of the firewall, and mount it on the front of the fuselage. Next come the side and top sheeting, canopy outline, and rudder. Cement the bellcrank mount and control horn in place. Cement the silk around the firewall and add wing weight to counterbalance the weight of the lines.

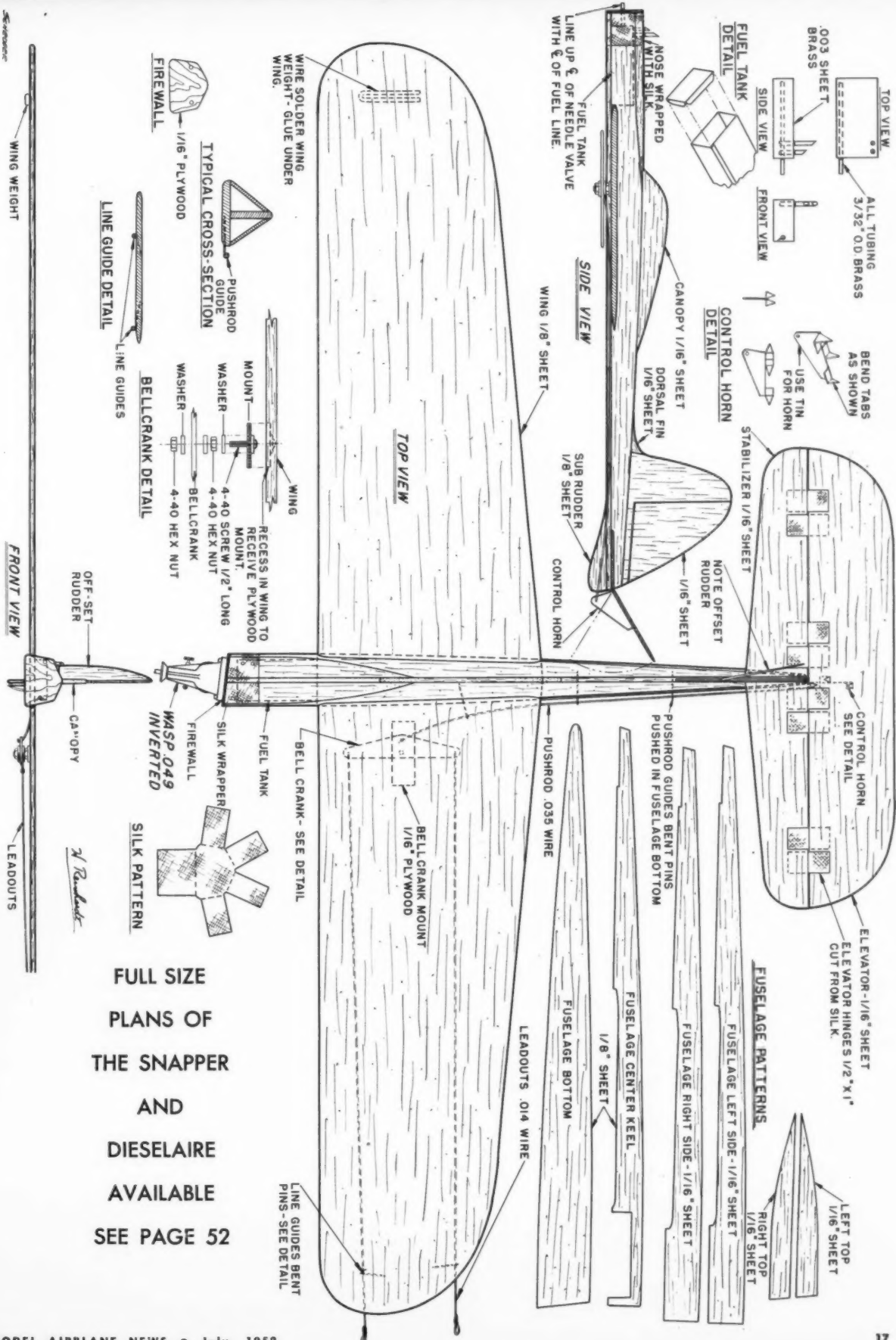
The ship is now ready for finishing. Sand all surfaces with fine sandpaper. Apply two coats of sanding sealer, one coat of clear dope, and a coat of hot fuel proofer of your own choice. If you use Sta, be sure to use it from filler to finish. Fly the ship on 20 or 30 feet of .010 line, depending on wind conditions. Landing gear is not necessary.

A Wasp .049 engine is used, mounted inverted. Don't worry about the engine sticking out of the bottom of the airplane. The plane lands like a feather, and the engine starts easier.

Below, left—Finished job, top view, shows right offset of the Wasp engine. The sheet wings bend in flight for dihedral effect.

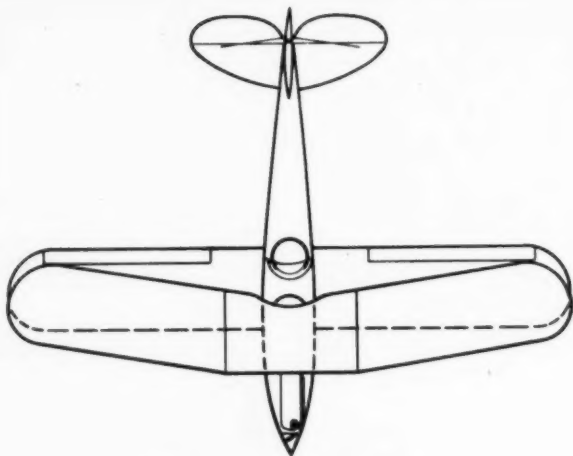
Right, below—One piece wing and stabilizer slide through keel piece, butting against top sheet that forms T-section for strength.



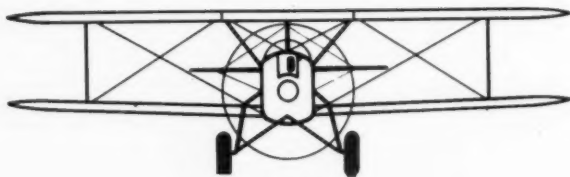


FULL SIZE
PLANS OF
THE SNAPPER
AND
DIESELAIRE
AVAILABLE
SEE PAGE 52

by RICHARD EALY



WE TEST



THE



GREAT LAKES



Cleveland's Great Lakes Trainer kit proves ability to do simple stunts, including wing overs and loops, when powered by engines as small as the Ohlsson .19

►Biplane models present many problems and the Cleveland Model Supply Company meets them very well in producing the 1" equals 1' scale *Great Lakes Trainer* kit for control models.

Their choice of design was a good one as the *Great Lakes* is an all-time favorite of scale builders. Perhaps this is due to the exciting lines of the ship—clean fuselage profile lines that would do justice to a racer, and wings that look similar in plan form to the famous *Helldiver* of the late 20's. It was a two place tandem, open cockpit, land biplane, powered by a 90 hp American Cirrus four cylinder upright and in-line engine. Performance was very good for the amount of available power—landing speed 40 mph, cruising speed 90 mph and a top speed of 110 mph. The ship, produced first about 1928, was a favorite of sport flyers and was used exclusively by several flying schools because of its good handling characteristics, excellent flying qualities.

It was with an eye on these latter qualities that the test model was built and flown. Having a wingspan of 27-1/4", length of 20-5/8" and a finished weight of only 17 oz., the craft handled easily with an Ohlsson .19 rotary valve, glow plug motor. Wing area is approximately 200 sq. in., which makes a light wing loading conducive to more than just straight flying as practiced by the ordinary flying scale.

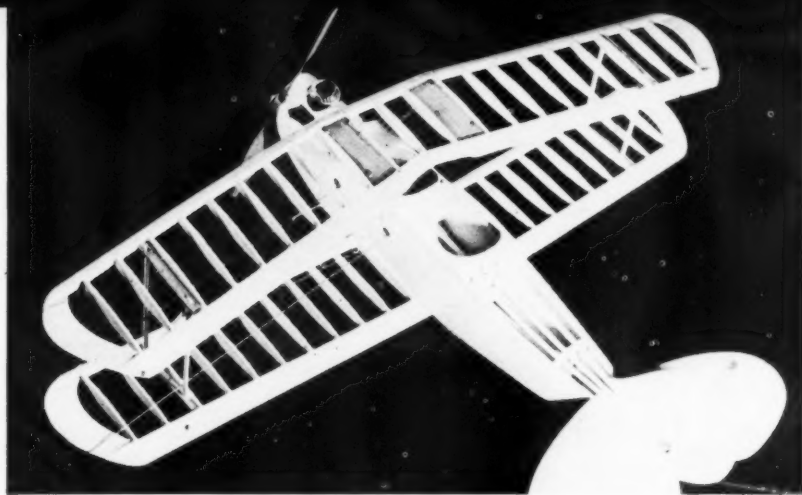
Our flying buddy, Walt Farrell of Montebello, California, has built some swell flying scale biplanes, including a successful 1" equals 1' scale *Fleet Trainer* which compared with the *Great Lakes Trainer* in size. So we asked him to try his hand at the controls and compare both ships for performance. As the kit plans show no control system but suggest using your favorite one, we installed the Jim Walker set-up, using the same size 2" bellcrank and 3/4" tail-horn as on the successful *Fleet*. In rigging the ship, we closely followed the procedure described in the October 1951 *M.A.N.*, covered fully with an article, "Can You Really Fly?" We'll describe this rigging later on this article, but urge newcomers in flying scale to hunt up this old issue and familiarize themselves on an important part of flying model aircraft.

All our precautions rewarded us on the test flights with a faster than average, lightly loaded biplane that took off quickly and fairly smooth. The first couple of flights were just straight, level ones to get the ship's feel. Landings must be done with some care as we have a three strut rigid gear; it sets down nicely if one is careful not to bounce it and end up over on its back. With the use of up elevator near the end of ship's roll, the tail keeps depressed and on the ground.

As on nearly all U-C models under 25 oz., we noticed at the very end of the ground roll that the plane would turn in, facing the pilot, due to weight of flying wires tipping the inside wing. By merely gauging the roll and easing up tension of the lines at the last second or two, the test plane rolled to a normal stop. The flights were made first on 45 foot lines of .012 steel wire and, as the craft showed itself to be fairly fast and light on the controls, we let them out to 50 feet. We then tried some simple maneuvers on the longer lines as the ship still handled easily in straight flight. Wingovers were performed with flying wires held tight in the overhead position. An inside loop was tried next and ship went through smoothly and pulled out in a precise arc with a minimum of mushing. The series of single loops were as far as we went in stunting as we felt this was pretty good for a flying scale and that any further stunting would be according to the ability of the pilot.

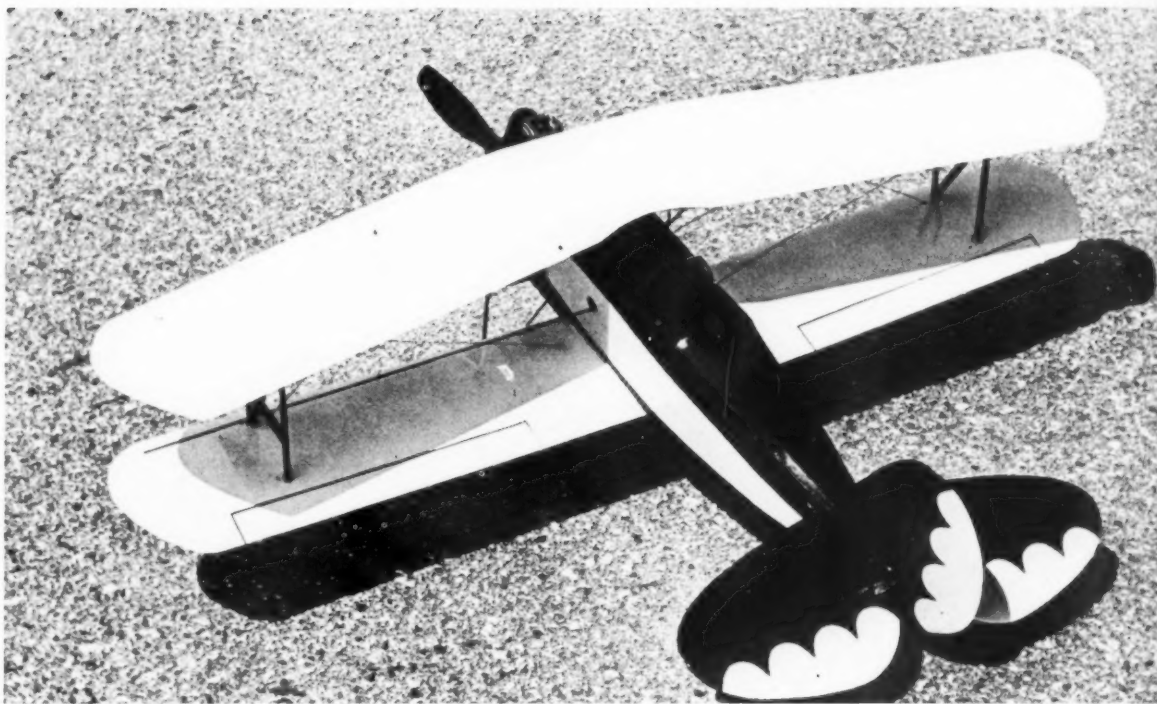
With the streamline stunt type airfoil on the *Great Lakes Trainer*, it is believed that the ship could handle inverted flight, outside loops and figure eights by experienced stunt pilots.

Comparison with the flying of the *Fleet Trainer* showed the *Great Lakes* to be about the same on the controls. The *Fleet* pulled harder as it had an Ohlsson .33 and ship weighed about 25 oz. while the *Great Lakes*, powered by an Ohlsson .19, weighed only 17 oz. It is suggested that those who have a *Torpedo* .19 try it for power. This potent mill will still fit the engine cowl and yet deliver as much power as the older and larger .29 engines. With that extra



Left—Smooth framework makes for neat covering and a good paint job, unspoiled by wrinkles.

Below—See what we mean? The Great Lakes is one of the all time favorites with scale fans.



power you could use longer lines—about 60 foot—and have more room to attempt the more difficult stunts.

The *Great Lakes Trainer* kit contains full-size drawings with step-by-step instructions, shaped balsa engine cowl, notched leading and trailing balsa edges, die-cut balsa wing ribs, die-cut balsa fuselage side panels and bulkheads, balsa stringers, die-cut balsa sheet tail and rudder, preformed wire gear stunts, tissue, tail cloth hinges, wood wheels.

The fuselage features notched bulkheads to lock in the side panels for strength. These just click into place. Be careful in bringing the sides together at the back. If one side should be harder than the other, it will not bend as much, thus drawing the softer one too far past the ship's centerline. Therefore do this operation right on the drawing, holding everything in place for perfect alignment while cement dries.

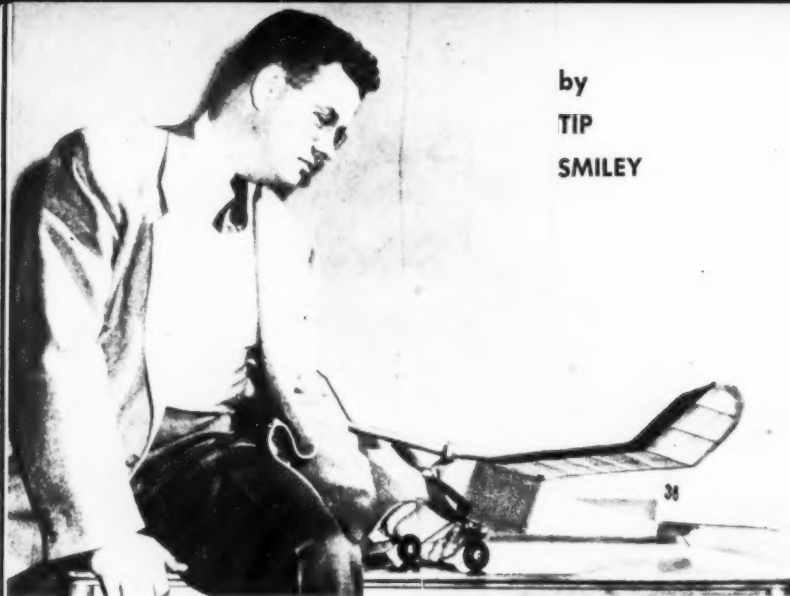
A one oz. Baker rectangular fuel tank was used on the test ship and located between motor and firewall former number one. This was adequate for the flying done by the plane. Top of the tank was on a horizontal level with

needle valve, and this fed well in the simple stunts described earlier. Some motors will not allow room forward of the firewall for fuel tank, so it must be located back of firewall between the motor bearers. For engines in .19 class like Ohlsson, Arden, McCoy, the #6 Perfect Rect-tank of 3/4 oz. will do for simple flying.

The #3 Perfect Wedgtank of 3/4 oz. capacity will fit the motor bearers if you elect to attempt the difficult stunts with these engines. With the .29 class and the hot Torpedo .19, a larger #8 Wedgtank of 1-1/4 oz. is recommended for stunting. A rectangular tank of one oz. to 1-1/2 oz. will be sufficient for straight flight and simple maneuvers in this larger engine class.

Kit plans direct installation of your favorite controls mounted midway between formers one and two, which was done using a 2" bellcrank with 3/8" offset for pushrod. Incidentally, this bellcrank location coincided with that of the Fleet and, as testing revealed good flying qualities, we suggest no change in mounting the bellcrank. A piece of 1/16 x 1-1/2 x 2 plywood serves nicely for mounting

(Continued on page 40)

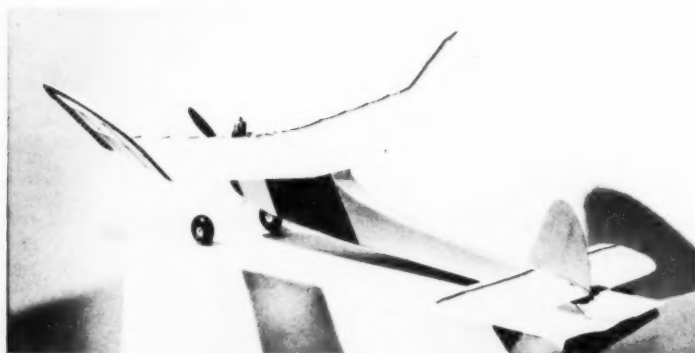


by
TIP
SMILEY

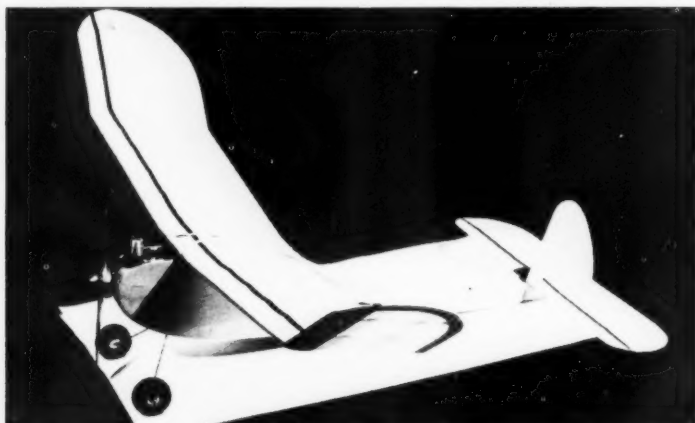
Wanting to make as many as possible fine flights in a short period of time, Tip made a few doodles—the scientific approach—and perfected the ship he displays here.

Dieselaire

Straight-up flights and crack-ups were forgotten in this outstanding effort to develop a real sport free flight. For diesels and glow engines it is built to last!



The sheet balsa construction makes the fuselage light, strong, and a cinch to build.



Shown here with .045 Mills, the "36" will take Cub .074's, Anderson .065's, etc.

► With the advent of the new small size engines, it was easy to recognize the potential opening for free flight design. To utilize these potentialities, the *Dieselaire 36* began its career as a very hasty pencil sketch. After several more sketches, and some area calculations, the final design was decided upon. Understand, however, that this model was never intended to climb straight up; sport models just don't operate that way. For a full days flying though, the *Dieselaire* is ideal.

The model pictured is powered with one of England's finest small diesels, the Mills, which has a displacement of .045 cu. in. Of course it is quite impossible to buy one of these little engines at every corner model shop, so the new glow-plug engines may be substituted, up to the O.K. Cub .074.

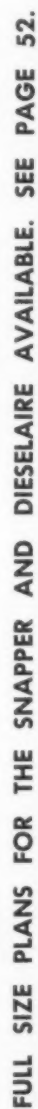
Contrary to popular opinion, sheet balsa construction is actually quite light, and it's a known fact that it is much stronger; hence we decided on this type of construction. Simplicity is evident from the plans.

One of the beautiful features of the sport type model is that you can get in so many fine flights in such a relatively short period of time. A bad crash is generally a foreign thing to a good sport flyer, so join the gang and give free flight that long awaited "shot in the arm."

We begin construction with the fuselage. Merely cut the two sides of 1/16" hard sheet balsa, and cement the 1/8" square balsa uprights in place on the inside of each sheet. (Positions of these uprights are shown in dotted lines on the plan.) Now cement the two sides together at the extreme rear, and add the firewall. When cement has dried thoroughly, place the cross-pieces in place at station No. 4. You will notice that the fuselage has the same width from the nose to station No. 4. From this point to the rear, the sides will automatically assume the correct contour. Next add the remaining cross-pieces between the sides. Now cement the engine bearers firmly in place, and add the landing gear, which is of 1/16" dia. steel wire. Landing gear mounting plates are shown on the plan. Use cement liberally as the landing gear takes the brunt of the abuse encountered in landings. As a final step, the top and bottom of the fuselage are added. At points of extreme curve, such as the nose and "swayback," run the grain of the wood cross-wise. After sanding thoroughly, cut the opening for your engine. This completes the fuselage assembly.

At this time we begin construction of the fin and stabilizer assembly. The fin is simply cut from 3/32" medium sheet balsa, while the stabilizer is of built-up construction. Leading edge is of 1/8" square hard balsa, center spar is of 1/8" x 1/4" hard balsa, and the trailing edge is of 3/32" x 1/2" hard balsa. Ribs are of 1/16" x 1/4" stock. Trim ribs to contour after stabilizer is completed and has been removed from the plan. Now the tail assembly is complete, leaving only the wing to be built.

As construction is conventional, the wing is built right over the plan. Five separate panels are required to complete it. These are the center section, the two inboard panels (one right, one left) and the two tip panels. Notice the rugged construction; an ample number of strong spars practically guarantee a long life for your model. Don't worry about the extra weight, because this model is for sport. The dihedral templates shown on the full-size sheet are used to give all the ribs in each respective panel the correct slant. The ribs in the two left panels slant to (Concluded on page 40)





Control box is automatic key set to operate 2-4 times a second. A cam varies the signal-on and signal-off. Powered by miniature motor, worm gears.

for the R.C. fan

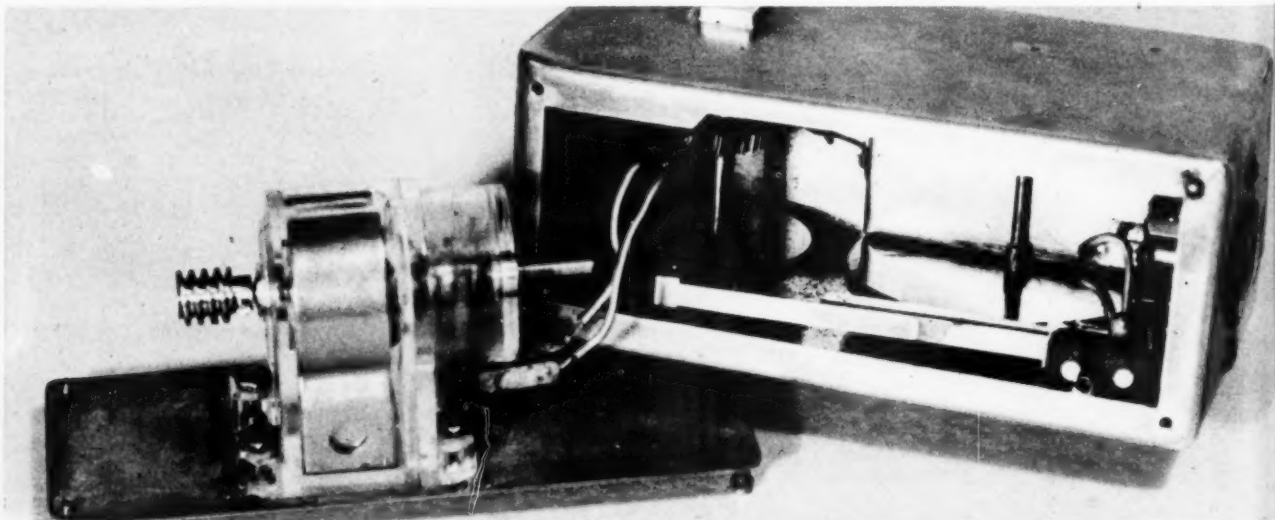
Flip-Flap Control

by NORMAN S. BRISKMAN

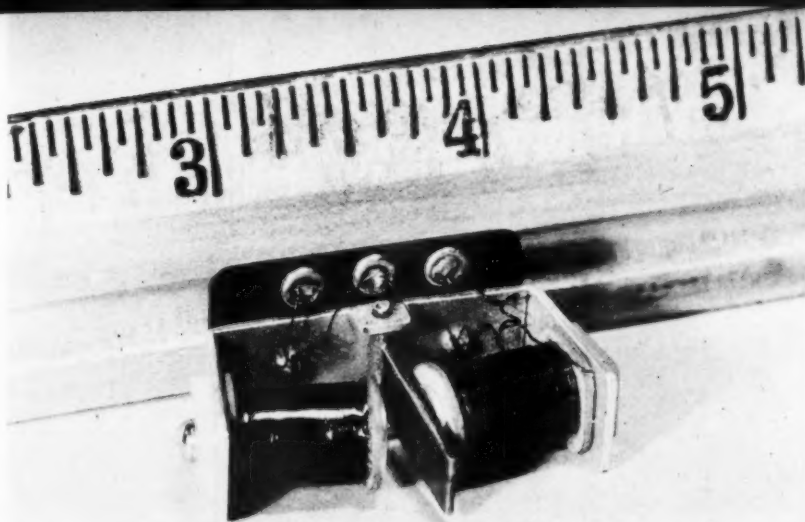
If you can fly radio, you could fly with proportionate control—so simple is this gimmick!

► To those of you who are familiar with proportional control, this new actuator should be an addition. For the many who have not yet experienced this phase of control, this will be a simple and direct introduction. Proportional control was first introduced in the July 1947 M.A.N. More recently (Nov. and Dec. 1950), George E. Trammell again presented proportional control with many refinements and good detail. And it works! My *Super Brigadier* equipped with Trammell's control actuator performs well.

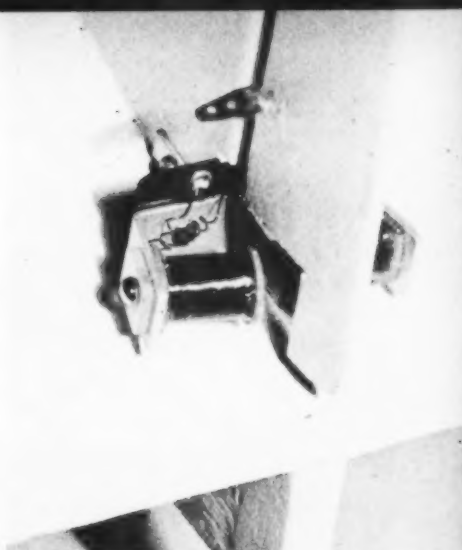
But now I would like to add one more of these actuators. This came about in trying to simplify gadgets, to reduce all possible chances of error, and still keep the ultimate goal. Through my own experience I have seen



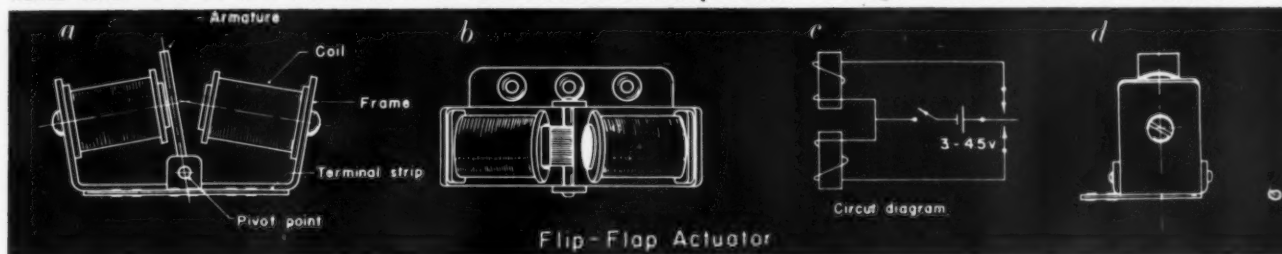
Opened control box shows parts: case 22 gauge bronze, contacts from surplus, cams micarta, though plexiglass, metal will do. Plugs into transmitter.



Actuator uses home wound coils, Control Research cores. Other size coils require other size frames. Current: 3 to 4½ volts. Good feature is that radio failure means return to neutral.



Actuator armature is built into the rudder. Usual linkages and rubber bands are eliminated.



Flip-Flap Actuator

Details of the actuator. With only one moving part there is little that can go wrong. Unit can be closed in with detachable cover for protection.

more over-controlling and excessive gadgets than need to be to fly a plane. Of course there is some worth in all these controlling elements, but knowing how to use each and to use only what is needed is a problem.

The flip-flap actuator is the product of my "sorting." The actual working of the unit is not new, but how it is utilized becomes its focal point. Its operation is simple inasmuch as there is only one moving part. Linkage is eliminated. The actuator can be set directly in position with surfaces to be actuated (rudder, flaps etc.). Weight and size are a bare minimum. Construction is light and simple.

Battery supply is kept to a single source of three to 4-1/2 volts. The battery drain is not actually continuous because of the slight pause between activating each coil. The single source has the advantage of giving equal strength in either extreme position. If however the battery should fail, then the activated surface would tend to neutralize. There would not be any pull either way from the coils, and air pressure on the surface would tend to neutralize it. Having the contact at the extreme movement of the armature also assures that air pressure will have little effect to reducing the movement of the surface.

Constructing this unit is quite simple. First get two coils of the type used in regular escapements. The coils shown are self-wound, Control Research cores with #34 wire to about 5 ohms. If you use the same coils it will not be necessary to change the details of drawing one. However, if you choose coils of another size, it is a simple set up to make the proper frame. First determine the extreme movement you wish of the armature. At the extreme position set a coil end perpendicular to the armature. Do the same with the other coil. This will give you the size and end angles for the frame. If you find it necessary to reduce the travel of the armature, either blocks can be set to keep it from its extremes, or set screws can be added to the frame which will act as stops for the armature. The frame is made of .040 aluminum. A scrap of 1/16" core iron will do well for an armature. Solder

a piece of brass tubing to one short edge of the armature. This will be the pivot point.

Assembly is simple. The coils are secured to the frame ends, the armature is set between the pivot points and a pin will serve well to hold it. The terminal strip is micarta with three eyelets. There are three terminals, one is a common take off for each coil. This is hooked up to the armature of the receiver relay. The other two leads, one from each coil is taken—one to each contact of a single pole double throw relay. An on-off switch should be placed in the common lead.

The actuator should not require any adjustment other than changing the travel of the armature. The important part is to set the coil and armature perpendicular at the extreme. With only one moving part very little can go wrong with this type of actuator. The armature will either pivot or won't, and to insure this give the armature a free pivot.

To install the actuator we'll use rudder as an example; there is a clear picture of this. As you see the armature is actually part of the rudder. Mounted at the base of the rudder there is good support and is not to open to damage, in case of a crack-up. The unit can be housed in a fairing if clean lines are desired. But, for good practice, get the ship to fly well, then doll it up.

With the actuator you will need a control box. Actually it's a simple mechanism. It takes the place of the conventional micro-switch. (This too can be used as explained by Trammell.) The control box is nothing more than an automatic key set to key at two to four times a second. Add to this a cam that will vary the signal-on to the signal-off portion and that's it. Except for a miniature motor and a set of worm gears it's all home made. The case is made from 22 gauge sheet bronze, the contacts are from surplus, the cams micarta (plexiglass or metal will do) a few pieces of tubing, wire and a couple of springs. Of course variations of this can be made and should to accommodate the material on hand. The principle should remain the same. Size and weight need not enter into such a unit; it is only ground equipment.

AMA official news

by RUSS NICHOLS
and CARL WHEELLEY

**Complete info on Nationals
events • Flying scale events
rules • the Contest Calendar**



Lt. Cmdr. John Burton, right, leaves for Tokyo. Navy's new representative, Lt. Cmdr. Howard Eddy, left. Second from left, AMA administrator, Russ Nichols; and AMA president, Frank Bushey.

► **1952 NATIONALS.** To be held at the U. S. Naval Air Station, Los Alamitos, Calif., this is the schedule of events:

Sunday, July 27—Advance registration and test flying.

Monday, July 28—All indoor events (Hand-Launched Glider, Stick, and Cabin Rubber) to be held at the Santa Ana Air Base from 9 AM to 9 PM. Finish registration and test flying. Transportation will be furnished from NAS Los Alamitos to the site at Santa Ana, a distance of approximately 13 miles, for those entering the indoor events.

Tuesday, July 29—Radio Control, Control Line Speed Class A, Free Flight Gas Class B, Towline Glider, Unlimited Rubber.

Wednesday, July 30—Radio Control, Control Line Speed Class B, Free Flight Gas Class AA, Outdoor Hand-Launched Glider.

Thursday, July 31—Radio Control, Control Line Speed Class C, Control Line Precision Acrobatics, R.O.W. Free Flight Gas, PAA Rubber-Powered Payload.

Friday, August 1—Radio Control, Control Line Speed Class D, Free Flight Gas Class A, Wakefield Rubber.

Saturday, August 2—Radio Control, Control Line Combat, Free Flight Gas Class C, AA PAA Load, Team Rac-

ing, Free Flight Gas Class AA Scale.

Sunday, August 3—Radio Control, AB PAA Load, Control Line Flying Scale, Navy Carrier Event, Control Line Jet Speed, PAA Clipper Cargo.

The Victory Banquet will be held Sunday night and all trophies will be awarded at this time.

The location of the indoor site for the 1952 Nationals is one of the best ever. The hangar to be used has a floor 1100 feet by 200 feet with 187 feet of ceiling clearance. All openings can be closed tight enough to assure there being no air currents inside.

There will be an area allocated for test flying of outdoor models and will be available at all times during the meet.

Processing for each event will be done every evening before the model is to be flown the next day. Processing the day before will not be required for indoor events. Processing hours have been set from 5 to 9 PM.

For retrieving, what is believed to be a fine arrangement has been worked out. Plenty of transportation and communication between the field and cars will be available.

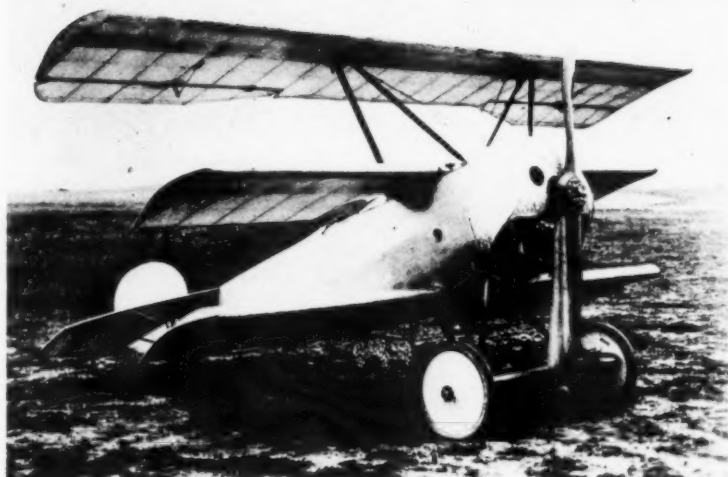
The fees for entry in

(Continued on page 45)

It was cold last winter when the Green Bay Model Airplane Club, Green Bay, Wisconsin, flew regularly on Sunday afternoons from

the frozen over Bay. As many as 50 cars drove out five miles on the ice. Members build free flights, control jobs, and even rc.





German Air Service turned down first unbraced wing Triplane because they thought it would not hold together in combat. Unbalanced ailerons also had been utilized.



Rare side view of Dr-I with Oberursel 110 hp engine. Richthofen's ship, however, used captured 80 hp LeRhone rotary. Great German ace ultimately shot down in Triplane.

FOKKER TRIPLANE

Fokker, in cockpit, instructed German mechanics in armament of Dr-I. Ship is blocked down preparatory to firing guns. This sighting test is still used practice in 1952.



Young Tony Fokker at the time of the Tripe's design. His name is used today by Dutch plant.

WORLD WAR I

by ROBERT C. HARE

Richthofen in his Triplane, most feared ace of 1917-18.

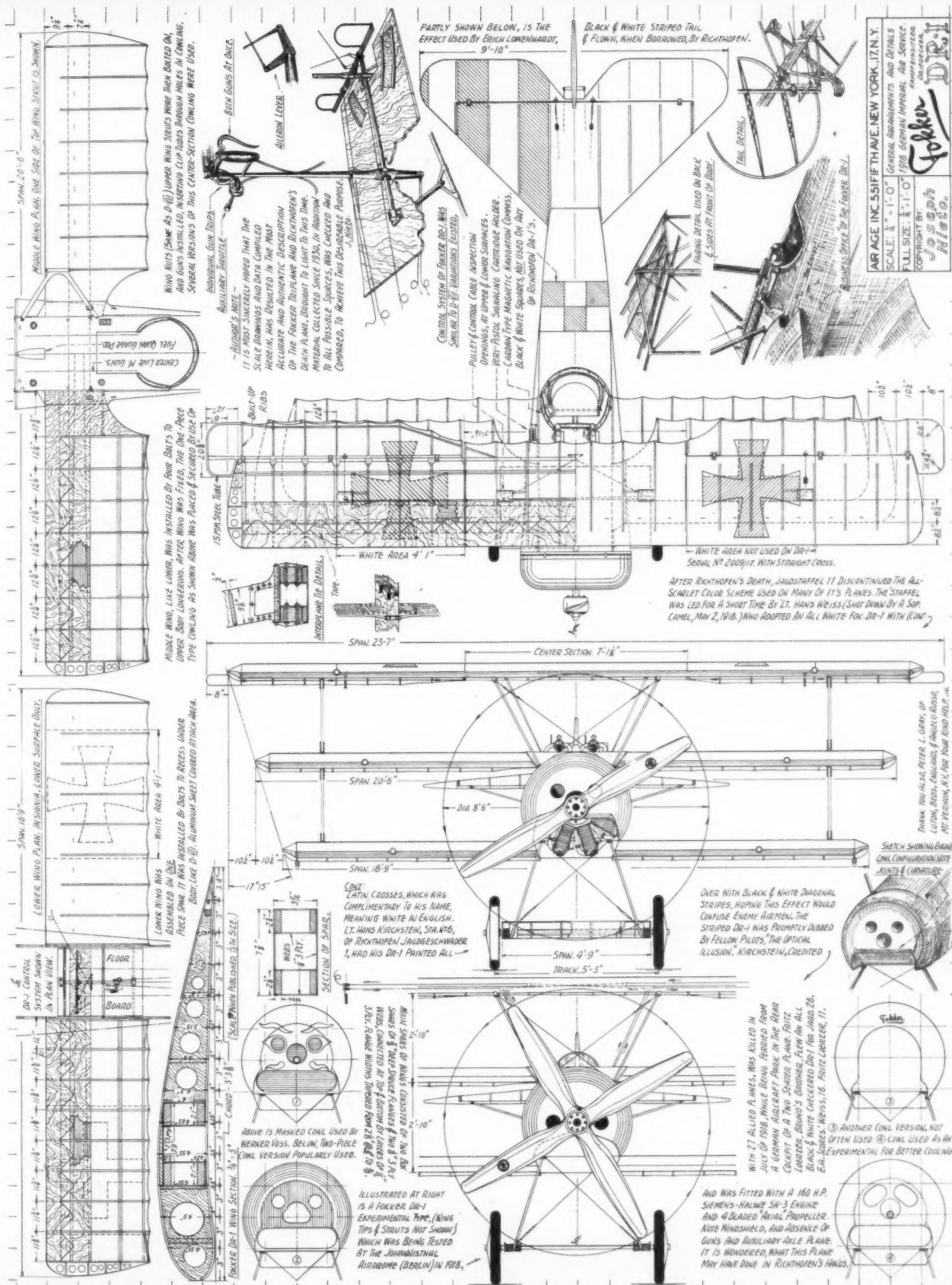
► September 1917, started off with a bang for the Imperial German Air Service. That month marked the introduction of the Fokker Triplane as an operational pursuit. This new ship was heralded as a super fighter; it was the shot in the arm pilots of the Black Cross needed badly to bolster their moral.

Only five short months before, they had been flushed with victory—Bloody April, 1917, had been the high water mark of German air superiority. But now, British Camels and S.E.5's and the French Spads had begun to pay off for the Allies. By September, the German war birds found themselves outclassed in planes, in spirit and in moral.

During this period, several of Germany's top aces had fallen under the guns of Allied pilots, notably the seemingly invincible von Richthofen brothers: Lothar, the younger, was shot down on May 7, Manfred was wounded on July 6.

In September, Baron Manfred von Richthofen had returned to the Front, and with him came the Fokker Triplane. The Baron, with 59 victories, was little more than a shadow of his former self. The bullet that creased his skull in July had destroyed his confidence. The faces of many of his squadron mates—men with whom he had flown into battle scores of times—were gone, replaced by bewildered pale-faced youngsters, who had no heart in the war.

Entry of the Fokker Triplane into this dismal picture, together with the return of the Baron, was the combination General von Hoeppner, head of the Imperial German Air Service, hoped would turn the tide. On September 2, von Richthofen, flying the first and only Fokker Triplane to reach the Front, (Continued on page 53)





USE THE RIGHT CEMENT...

TESTORS FAMOUS MODEL AIRPLANE CEMENTS are formulated to meet the exact requirements of the cementing job you want to do. Keep both of them on hand at all times!

FORMULA A is *extra fast drying* for quick, easy construction of lightweight models and for on-the-spot repairs.

FORMULA B is *fast drying*... the *strongest* for balsa or hardwood... for metal to metal... for metal to wood. It is your best bet for general work. Available in 15c and 25c tubes.



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DON'T SAVE IT FOR A RAINY DAY...

Applying the finish to your model would seem to be an ideal indoor job for a rainy day. But actually it isn't so. That's because all fast-drying dopes have a tendency to "blush" (the formation of a milky or foggy film on the finished surface) when applied under humid conditions, even when they have been formulated to resist this effect, as is the case with TESTORS DOPE. "Blushing" is not much of a problem during the winter months when houses are heated and the atmosphere remains dry most of the time. During the spring, summer and fall, however—when rain and other weather conditions are not always so favorable—you can easily run into trouble. Therefore, choose a dry day for your finishing!

If you are in doubt, test results on a piece of scrap wood to make sure.

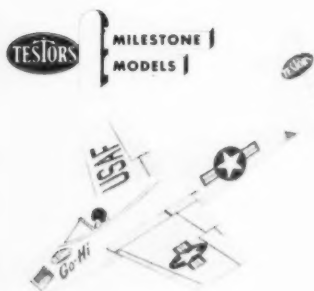
It is well to know, though, that if "blushing" should appear, it can be corrected... especially if you have been using a colored dope. Just rub the *thoroughly dried* surface with rubbing compound until the disturbing film has been eliminated. Since it is better—and easier—to prevent trouble than to cure it, you will want to be on your guard at all times!

Properly handled under suitable conditions, TESTORS DOPE will give you very pleasing results. Its excellent application properties, unequalled quality, and wide range of beautiful colors are guarantees of satisfaction.

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3rd MILESTONE MODEL

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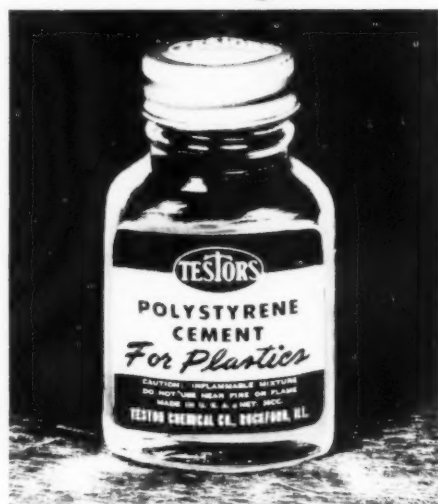
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TESTORS POLYSTYRENE CEMENT — also a new Testors item — functions as far more than just a stick-together adhesive for polystyrene plastic. Actually it *fuses* the parts together so that they are permanently joined in a real bond. Perfect for your model building; also for all kinds of mending and repairing jobs on plastic toys, household items, etc. Formulated with proper viscosity to permit easy, even application without excessive running or spreading. Comes in handy 15c bottles.

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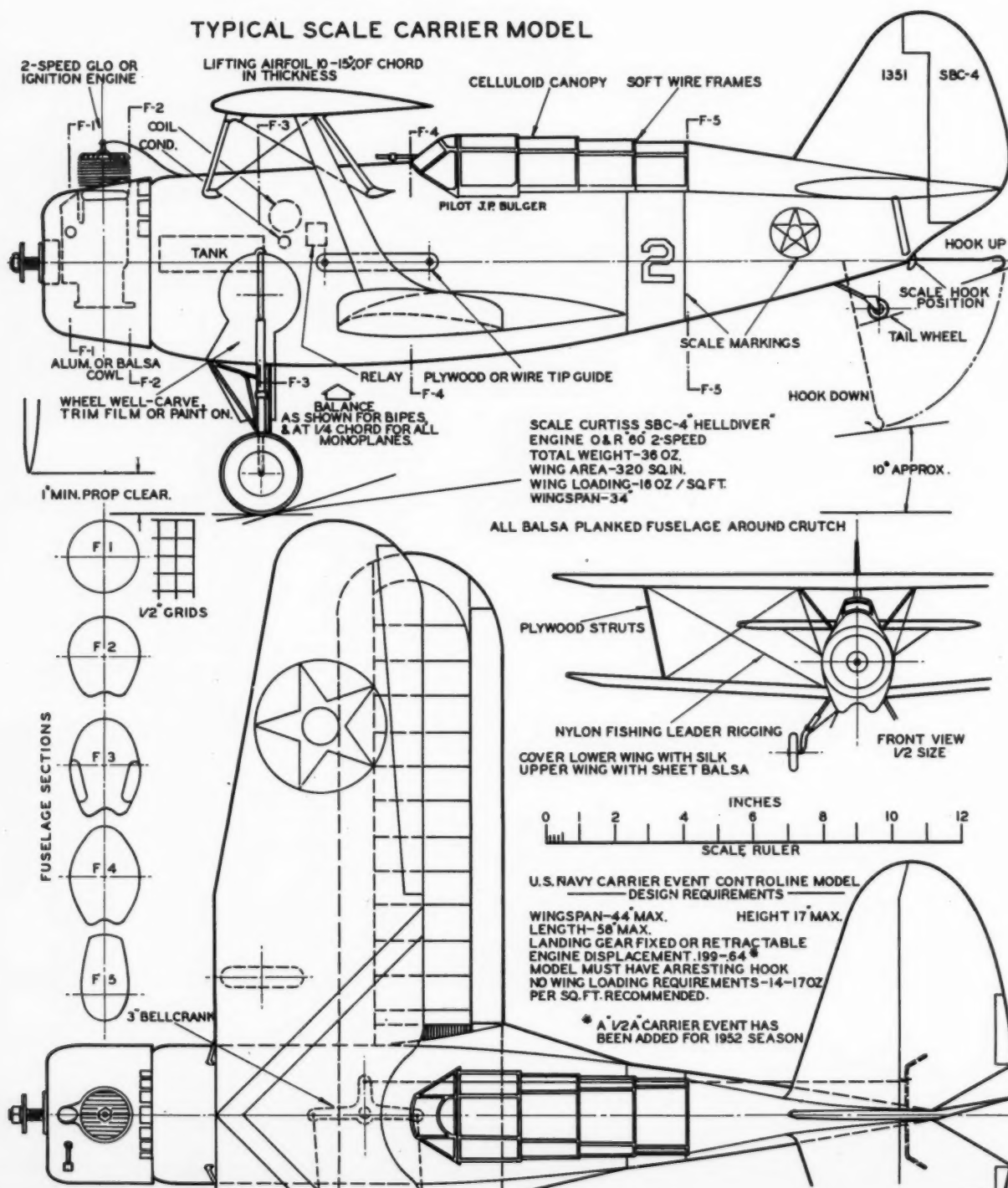
design detail

Carrier Models

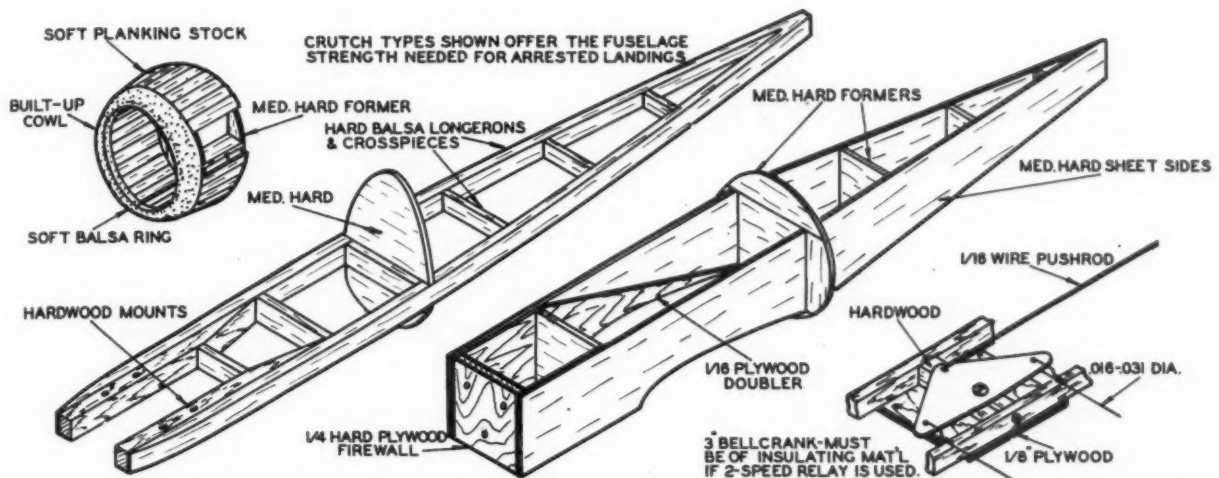
... by Harry Williamson

You owe it to yourself to make one of the fascinating scale control jobs. Sure are the answer if you want something different.

TYPICAL SCALE CARRIER MODEL



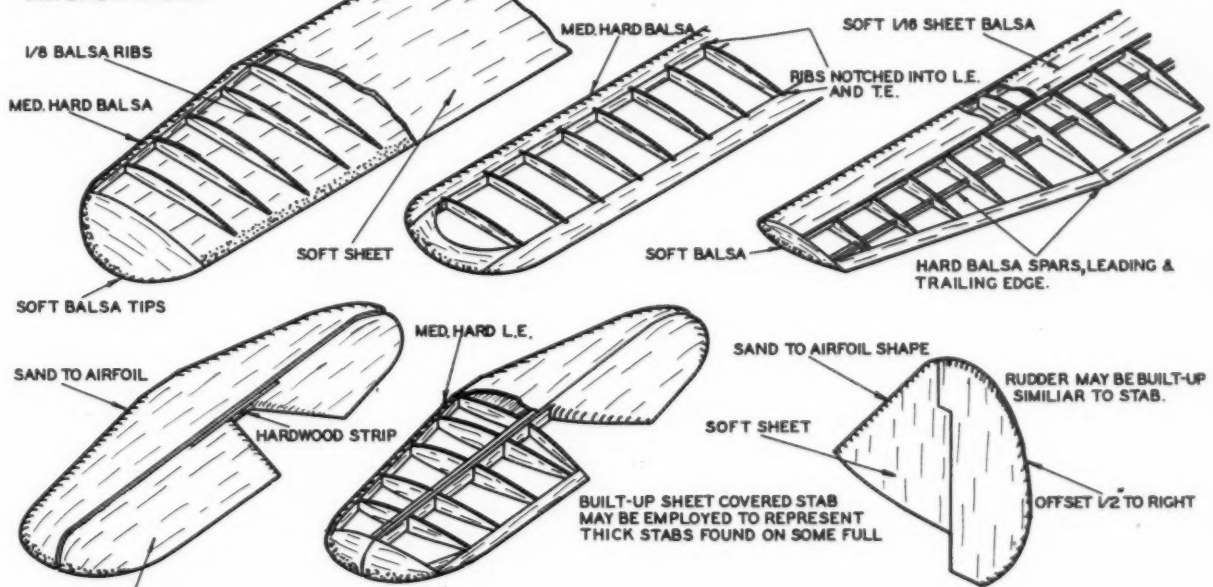
CONSTRUCTION DETAILS



FUSELAGE CONSTRUCTION MAY VARY ACCORDING TO THE TYPE EMPLOYED IN THE FULL SIZE PROTOTYPE. PLANKED OR SHEET COVERED TYPES ARE MOST PRACTICAL TO SIMULATE ALL METAL CONST. NYLON OR SILK SHOULD BE USED TO SIMULATE FABRIC CONSTRUCTION.

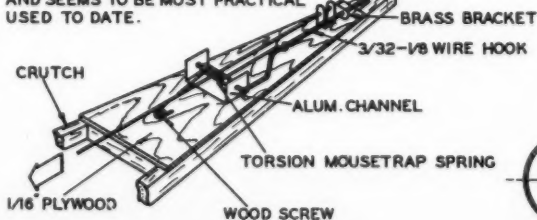
COVERING THE ENTIRE MODEL WITH SILKSPAN, SILK OR NYLON ADDS STRENGTH AND SIMPLIFIES FINISHING.

THE WINGS SHOWN ARE MOST PRACTICAL FOR THIS TYPE OF MODEL. THE TYPE CHOSEN SHOULD BE GOVERNED BY THE FULL SCALE CONSTRUCTION



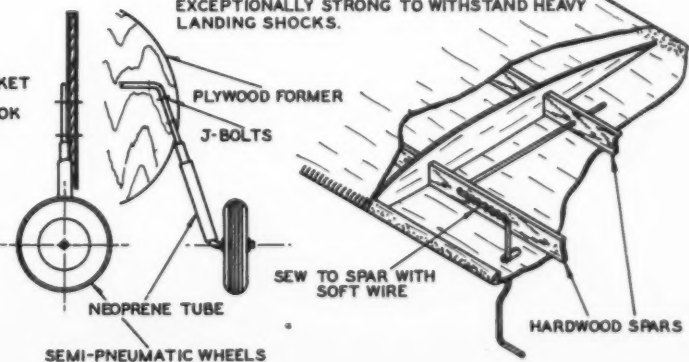
3/16 OR 1/4 THICK MED. HARD SHEET

ARRESTING HOOK SHOWN IS SIMILAR TO THAT USED BY CAL SMITH ON HIS 'SKYRAIDER' AND SEEMS TO BE MOST PRACTICAL USED TO DATE.

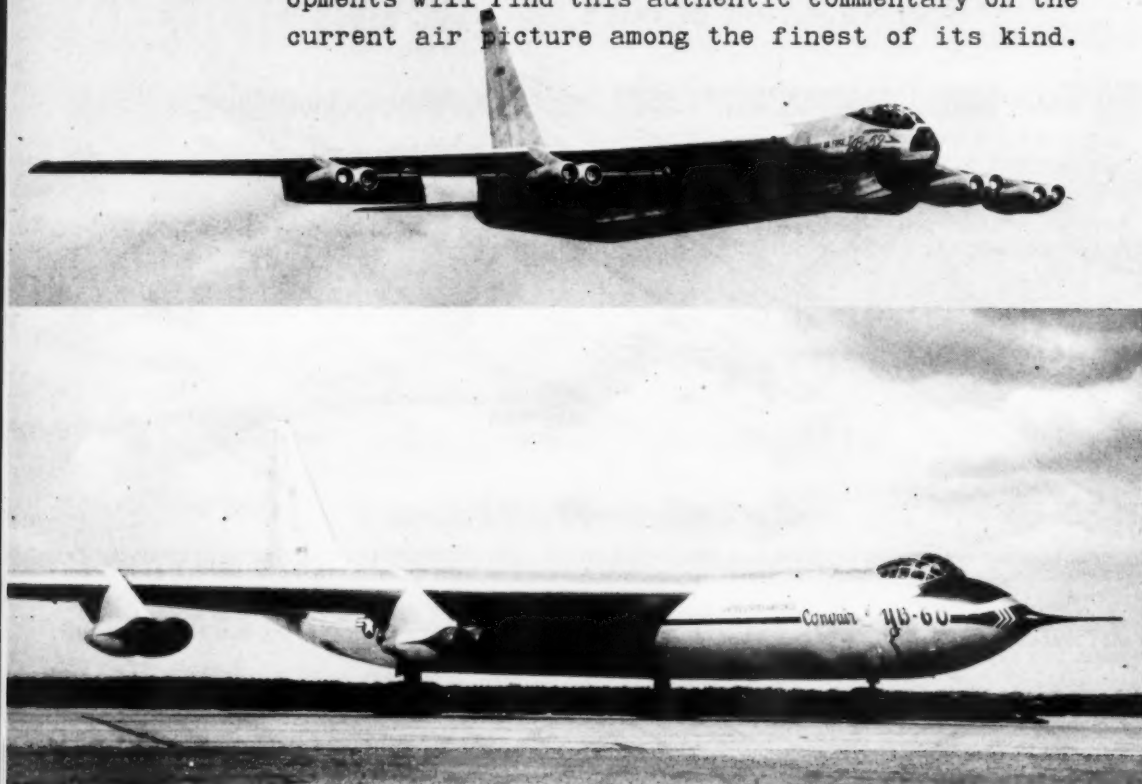


1/16 DIA RELEASE WIRE. HOOK MAY BE TIMER RELEASED OR FROM THE BELL CRANK SIMILAR TO TEAM RACER FUEL CUTOFF.

LANDING GEAR & INSTALLATION SHOULD BE EXCEPTIONALLY STRONG TO WITHSTAND HEAVY LANDING SHOCKS.



Modelers who would keep abreast of aviation developments will find this authentic commentary on the current air picture among the finest of its kind.



With its eight jets smoking, wing noticeably deflected under the load, and huge flaps down, Boeing's B-52 makes its first take-off. Its rival in AF competition is the Convair B-60, eight-jet, sweptwing version of the stately B-36. Powerplants on both planes are Pratt & Whitney J57 turbojets. On the Boeing, bicycle type landing gear is used due to the thin wing, retracting into the fuselage.

planes in the NEWS

by David Anderton

► The uncertainty of the Far East fracas has been reflected in just about every facet of American life. We've learned that our independence—and helping other countries maintain theirs—is expensive. But we've been mature enough to pay the bill without too much complaint.

That bill breaks down across the military board for weapons, men and administration. Our own particular interest is airplanes, naturally.

And so about this time every year, we scan the testimony given to the Congress by military and civilian leaders of the services. Here's the way it shapes up for the fiscal year ending 1953 (that year starts July 1, 1952 and runs to June 30, 1953):

The total aircraft bill is \$14 billion. That's roughly \$100 for every single one of us. Most of the money is for planes; only \$1 billion is for guided missiles. The Air Force wants \$11 billion, of which \$6-1/2 billion buys planes. The rest is spares, administration, industrial mobilization and the like. The Navy wants about \$3 billion for planes and parts; and the little Army gets the paltry sum of \$36 million.

The Air Force will buy 39 different types of planes; new among these will be the Convair XF-102, the Martin B-57A Canberra, the Douglas RB-66 and a service quantity of Boeing RB-52 bombers. Missiles will be bought from six different companies.

The Navy is to purchase 27 different models during fiscal 1953. Among these will be the Convair F2Y-1 (first

mention) which is a delta-winged, water-based fighter capable of transonic speed, the Douglas A3D, and the Bell HSL-1 anti-sub 'copter. And Navy will buy three missiles.

Army will obtain the Beech L-23 Twin Bonanza, the De Havilland L-20 Beaver, and two 'copters—Sikorsky H-19 and Piasecki H-21. Army will support the production of two missiles.

That's the general picture for the coming year. That is the itemized bill that you are going to pay. When you hear the first salutes on the Fourth, and see the first red glare in the night sky, think of your independence. Then you'll know—as men have known before you—that it's not such a big bill to pay, after all.

► **Newest Thunderjets**—Republic has just shown two new versions of its F-84F sweptwing Thunderjet, scheduled for production at the company's Farmingdale, L. I. plant later this year. Currently flying are two pre-production prototypes which differ from the earlier version (featured in M.A.N., May 1951) in the use of wing root air intakes. Engines for the new jobs will be Wright-built J65 Sap-phires, currently rated around the 7,500-lb. thrust mark. The two versions of the swept T'jet are a fighter-bomber and a photo-recco job. Let's talk about the fighter-bomber first.

When it first rolls off the line, the F-84F will be using the nose inlet pioneered by Republic in the first F-84 and modified slightly for the first prototype F-84F. Later on, the F will have a solid (Continued on page 50)

"AERO GLOSS finished? Of course!"

A Champion's Ship
wins a
Championship

*Aero Gloss Finished Planes Sweep First
Place Appearance Awards at Nationals...

1950... Howard Thoms

1951..... Don Still

1952..... YOU?

APPEARANCE is as important as performance to Champions like Don Still, whose semi-scale stunting Stuka was awarded highest appearance points at the 1951 Nationals! "Of course I used Aero Gloss throughout," says Don.

Right now, in Beaumont, Texas, Don is readying his models for the 1952 competitions... and you can bet that, like other Famous Folks whose planes carry off the prizes year after year,* he's added the final touch of perfection with Aero Gloss—The Finish That Mirrors Perfection!



4 ounce jar
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A true airplane dope—with binding and stretching qualities that add strength to your model.

Really hot fuel proof—eliminates extra time-consuming separate coats to make your model fuel proof.

Binds to surface—will not crack or peel, adding durability and long life to your finishing job.

Readily and quickly patchable—saves time when unforeseen accidents mar the surface.

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ALWAYS use good quality camel hair brushes.

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ALWAYS apply primer to metal parts, dry and sand, then apply dope.

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Scrap Box

(Continued from page 5)

1950 and awarded in the 1951 Southeastern, the winner was chosen from Stunt-Scale classes. For the year 1951 and to be awarded at the Southeastern June 14-15, the top speed and jet man will receive the trophy. For the year 1952 and awarded in 1953 will be from Free Flight and Radio Control. For the year 1953 and awarded in 1954 will be Rubber and Glider top man. After this a similar rotation plan will be completed. Competition is limited to registered flyers in the 5th AMA district.

The Atlanta Exchange Club, sponsors of the Annual Southeastern meet, together with CAP, held a full scale air show, Betty Skelton featured. Helped build up their Model Airplane Project Fund.

F. E. Story, prominent merchant of Talledega, Ala., and chairman of the Talledega Model Airplane Exchange Club project, is anxious to promote a meet in Talledega. Get busy and see Mr. Story, you modelers. Help get this one on the road.

The Milwaukee Aeromodelers have been holding monthly forums in conjunction with the Milwaukee County Plymouth Dealers. One of the meetings last February brought out 60 stalwarts in a raging snow storm. Carl Goldberg came up from Chicago and gave the boys a rundown on modeling and his experience. The floor was opened for questions and he was deluged.

At another meeting one of the engineers from Niles Testor's Lab. gave them the old "one-two" on how to finish models. Can use tips like that anytime. The plane I.D. contests and AA engine starting competition, etc. keeps plenty of interest brewing in this club. Even have a 14 yr. old R.C. fan with three years experience. He's flying a Windy Joe from M.A.N. Good thing these youngsters fly in their own class. None of us old men would win anything.

The Kansas City Mo-Hawks have swung into the AA Scale Free Flight group. Their primary concern in the May meet was to bring the contest to the attention of model builders in the state. The experimental sanction for the meet was granted so the scale rules committee of the A.M.A. might obtain more information on which to base any official A.M.A. scale rules.

We haven't said much about the Nationals even though we're on the committee. Carl Wheeley and Russ Nichols will give you the amassed dope but our two-bits worth is as follows: we've enjoyed working with the swell gang who will help run the big "effort" and would like to go on record as saying this should be the best yet. Going to have to go some to clear Maurice Teter's high mark set in Texas. We're all still bowing towards Texas when thoughts dwell on the excellent efforts put forth there by Maurice and his crew. John Bollinger, our great white father this year, is extending every effort to make this a top notcher. Come on out and see the ocean fellows. Don't forget the models.

Johannesburg, South Africa—Things are a bit rough per Victor de la Porte. Model supplies in this country have deteriorated and American supplies have become less and less. American engines are practically extinct. The English diesels go like blazes down there BUT they are out of their classes here. In S.A. they fly American engine classes and the English engines are usually .01 cub. inch too large. Take the Amco 3.5 c.c. engine—it compares favorably with any American .19 but when the capacity in cubic inches is worked out it's rough to find that you have a 2005 cub. in. engine. You're in the B class with the Torp 29's, etc.

Team Racing is to be flown for the first time in a National Contest in S.A. this year. Should be interesting to hear the results. Looks like there is a monopoly on Control Line speed. Same club, Pretoria Aero Club, just about takes all the hardware in all classes each year. F.F., rubber, and towline are usually a tossup.

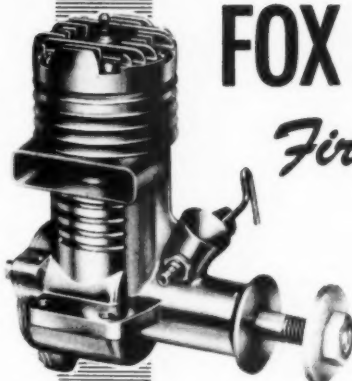
How would you speed merchants and stunt aces like to take a whack at flying in Johannesburg? Altitude—6000 ft.

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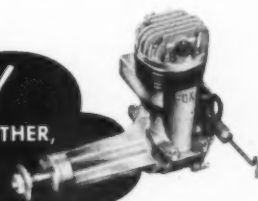
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France—Ran through a few issues of *LE MODELE REDUIT D'AVION* and was interested in trends shown. Interest followed gliders, large and small, plus airfoil sections. Engine breakdowns and power curves were also featured. Followed on through and Team Racing seemed to be one of the uppermost thoughts in the modelers' minds. Too bad we can't read (French, that is) but will try to get a bit of interpretation for future issues.

Spain—The *EL AEROMODELISTA* featured scale ships plus breakdowns of a *Sky Buggy* we never saw before. Fuselage construction was via the slab sided route. Sure, you get in this one and fly. Think the name is *Lacroix 2LB7*. Have always noted the modelers on the other side are a bit gone on the glider building. Guess the engine and fuel situation stops them. Quite a discussion on stunt jobs featuring the *Stearman*, *Stunt Wagon*, and a Spanish ship of undisclosed name. Looked good. Team Racing influence has hit here also. Could call it a draw between T.R. and Gliders. Still need a translator.

Australia—The lads' interest is spread thinly throughout the modeling hobby. Caught a look per *MODEL HOBBIES* at Max Star-rick's *Wagtail*, a development of Dick Schu-macher's *Little Ship*. Re-design simplified construction and gave the needed push to gain extra performance necessary for the more advanced pattern. Twin rudder develop-ment helped plenty. (We watched E. J. Brown's performance climb with the twin installation.) Radio gear used "Maxstar," commercial kit produced by Max. Under-stand R.C. has caught on as has T.R. Pun name for R.C. here is "Wireless" "C"ontrol. A "wheel" in T.R. is Ian MacDonald. Fire-cracker No. 1 was modified after successful flying to No. 2 and big things are going on now.

Stunt top man, Monty "Zilch" Tyrrell. Monty's taken over since Rupe Johnson and Ted Gregory have gone into another branch of flying. DeBolt's jobs hold plenty of interest here also. Large ships and small engines are a proven trend in Australia too.

The recent Team Races that were held in San Diego at the Airliners Field, brought out most of the "wheels" from the Los Angeles area. M. G. Hoyt and his wife Violet took first and third in the 140 lap main event with Keith Storey sliding into second place. Harold Ledington, Secretary of the S. D. Airliners, came up with one of the best "gimmicks" we've seen for releasing anywhere from one to four team racers at a time. The releasing device is made up of a flat plate of dural, approximately 1/8" thick, with another piece of dural shaped in a semi-triangle. This piece is bolted to the larger plate with washers between in such a fashion that it will swing freely. At the upper or outside swinging end of the plate, a piece of 1/8" wire is fastened which in turn is aligned with holes drilled in a double u-shaped clip which is also attached to the large stationary plate. The swinging plate is spring loaded to keep the 1/8" wire in place through the u-shaped clip. (The tail skid of the Team Racer is attached here.) Another clip is riveted or screwed into place toward the upper inside side of the swinging plate. This clip has about a 5/32" hole drilled through it to allow free passage of a 3/32" stranded wire. The stranded wire is fitted with an ordinary wheel collar (to allow for adjustment) which is pulled back against the u-clip on the inside upper portion of the swinging plate, which in turn swings the plate around, allowing the 1/8" wire to swing free of the double u-shaped clip which in turn releases the model. Four identical releases of the same pattern are made and placed in line in an angular position on the field, much the same as all other Team Racing stooges. The 3/32" stranded wire fits through all four swinging plates as explained with the four wheel collars positioned as required. The 3/32" stranded wire is carried on through all four stooges and approximately two feet beyond where it is attached to a spring which is fastened to a pin in the ground. The four large stooge plates are pinned or spiked to the ground, depending on the terrain, and the 3/32" stranded wire is carried on back to fit into an arm which is free swinging and attached to a large (approximately 12" x 12") plate 1/8" thick. This too is firmly spiked to the terrain. The spring loaded stooges hold

the 1/8" pin in place through the double u-attachment and the wheel collar stops are adjusted to fit against the u-clips on the upper inside portion of the swinging plate. Tension from the spring on the upper end of the 3/32" stranded wire keeps the wire taut its entire length, through the u-clips on the four stooges back to the release handle. When the arm on the release is turned, the stranded wire is pulled, which in turn allows the wheel collars to press against the u-clips on the stooges, swinging the plate around, opening the stooge and releasing the model. One single stranded wire does the trick. The usual stooge set-up has one wire from each stooge and adjust-ment is difficult. Contestants and spectators alike are usually stumbling over these wires. Ledington's set-up eliminates all of these worries and allows the pit men to step away from the models just before take-off without having to watch for a maze of wires.

20 YEARS AGO

"Will the Magnus Effect Eliminate Airplane Wings," asked R. Evans Otis, in an intriguing article in the July 1932 M.A.N. The Magnus effect was the name of the inventor who developed a revolving cylinder to generate lift. One or more such cylinders would be placed on either side of the plane instead of wings. Older readers will recall workable flying models of the day. Still another possibility was the use of small revolving cylinders in the leading edge position, something like present day slots. The cylinders actually were of an S shaped cross section, in this case, and the airflow swept between them and the wing to preserve lift. But time has written the answer to the title: No.

That July issue was a dilly. Model plans in-cluded a lightweight rubber-powered *Hawker Fury* by Stockton Ferris, a little sport biplane by Howard McEntee. Construction of the *Fury*, while merely standard for those days, would scare the daylight out of modern builders whose hot engines will fly a barn door. Wings, for example, had 1/16" sq. spars and 1/32" sq. split bamboo trailing edges. Don't split them any thinner, cautioned Fer-ris, or the dope may warp the framework. Formers were 1/32" sheet, the stringers split bamboo. Bamboo was an important material twenty years ago.

Probably the most interesting gas model of all time popped up in picture and write-up form, making it the first to be publicized. But what an engine—and what a plane. Forty boys in the Junior High, Pasadena, California, studying aeronautics built a 30-pound scale mail plane that flew 40 miles an hour on a two-cylinder, two horsepower engine. Two pints of fuel were carried in wing tanks in the bottom wing. It was launched—they didn't say how, shucks!—and pursued in cars. Small damage was reported. Picture that coming down in some post-war housing development. The engine was a work of art, with all parts being turned out on the shop lathe. The 31" prop turned at 3,000 rpm. Who was crowing about progress?

The ads were filled with glamor ships, such as Curtiss A-8's, *Fairey Fireflies*, *Hell Divers*, *Howard Racers*, *Gee Bees*, and *Hawks*. Those were the ships! Many are still king pins far as scale builders are concerned. World War I had suddenly been forgotten. Now, twenty years later, the first World War crates rate high again.

Air Ways, in July of '32, trended more to-ward ingenuity in design, than toward scale jobs as it does today. A 13-foot glider and a steam-powered job stood out. One chap had a 12-engined Dornier DO-X. Remember it? And how a big wind flipped it over on its back when at rest on the water? It was still possible to get your name in Air Ways simply by building an airplane. Such a list today would read like the Chicago phone book. Bruce Lester and Al Von Wymersch, then still living in Belgium, were on the list. Else-where contest results included both Frank and John Zaic, Johnny Young, Joe Kovel, who built the first KG with Charlie Grant about two years later. Modeling was perking up.

THE END

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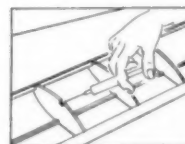
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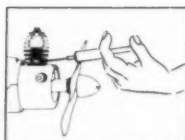
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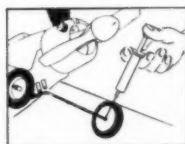
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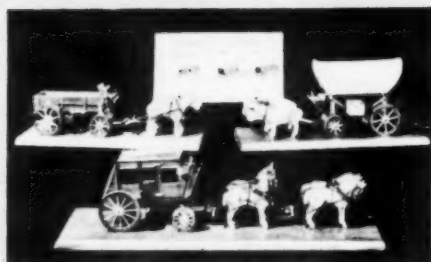
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Dieselaire

(Continued from page 20)

the left, while the right panels slant to the right. The ribs in the center section are set at 90 degrees to the plan. When all five panels are complete, they may then be joined. If you have used the dihedral templates accurately, the dihedral angles will be correct. Spar joiners are not necessary on this model, but if so desired, they may be made of 1/8" x 1/4" hard balsa, and used only on the main spar at each dihedral break. After a good sanding, the wing is ready to cover.

Your Dieselaire is now complete! Of course it probably looks rather naked standing there with no skin, so let's get busy on that covering job. The model pictured is covered with light weight (rubber powered) Silkspan, but a good grade of Jap tissue would be fine. We also suggest that you cover the entire fuselage to prevent splitting, but this may be omitted if so desired. If you like a fine finish, but hate to add the extra weight, you can really enjoy yourself by using all the dope you care to on this little job. The original, finished as shown, weighs a shade over seven ozs. complete with engine and prop, ready to fly! This is very light when you consider the rugged construction, coupled with the fact that the wing area of this model is 207.40 sq. in. That places the wing loading at about five ozs. per square foot. Color scheme on the original is white wings and stabilizer, clear doped, with orange and black trim on the leading edges. Entire fuselage and fin are color doped orange. We suggest that you use at least six coats of clear dope, plus two or three of colored on the areas mentioned.

Now for the flying! Select a nice calm day for your initial test hops. Run your engine as slow as possible for the first few flights to familiarize yourself with the models disposition. This model should balance at 1/3 of the chord from the leading edge of the wing. Adjust carefully for trim before trying too much power. When you are satisfied with the flight pattern, you may progressively add more power to each flight. If you have chosen an .099 engine, the performance should be out of the sport model class, especially with the light weight of this model. An 8" dia. x 6" pitch Power Prop and an 8" low pitch Top Flite prop have been used successfully on the Mills version pictured.

We Test The Great Lakes

(Continued from page 19)

of the bellcrank on top of the motor bearers. Horizontal tail is next and a thin tail horn using a 3/4" leverage worked fine on the test craft, so no change is recommended here. It was located at tail center with horn on right side of ship.

Building the wings is easy as framework is constructed on top of drawing. Lower wing is straight on the leading edge and provides no difficulty, but the upper wing with sweepback was done by assembling ribs in notched spars and twisting frame to fit the drawing. This must be done carefully to avoid cracking ribs at trailing edge. Since the airfoil is curved on the bottom, the spars must be blocked off, drawing at each end. Scraps left over from the die-cut ribs worked fine for these shims. Although the wings are strongly made, extra ribs were added to the test ship to improve the tissue covering. Small 1/32 plywood splices reinforce all spars at the breaks.

On other biplane scale models it was found that a strong center section strut system makes the difference between a model of limited flying and one capable of being flown over and over. Severe stresses encountered in stunts, bad landings, etc., are transmitted through the top wing to fuselage by means of 1/16 diameter steel wire, square U-shaped struts that are bolted in place at both ends. This is considered good aircraft practice as real ships have their wings bolted in place with steel tubing struts.

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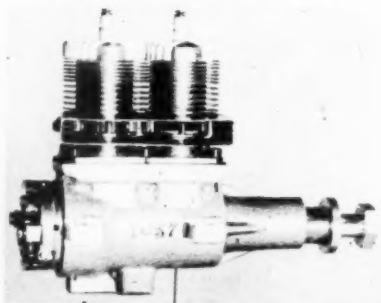
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fuselage. The upper wing has plywood plates for attaching struts and these fill the space between two wing ribs—the outer rib being the one at the spare break for the sweep-back. Make the main front and rear U-shaped struts of 1/16" steel wire. Wrap two 1/2" wide tin straps around bottom of strut and locate at strut bend. Bolt tin straps to plywood plate and fasten with 2-5/8 machine screws. Each side is braced by diagonal 1/16 wire struts attached with tinned wire and soldered. Upper end of struts have electric lugs soldered and then bent over to fit under side of plywood plate of wing, being sure incidence is kept at zero angle.

By using this bolted method you can make a perfect covering and paint job. Here's how—cover top of lower wing and bottom of top wing and paint them, holding it down on work table to insure no warping. Next, cement lower wing in place on fuselage. Bolt upper wing in place. Attach outer struts. If you want to make your wings the very strongest, the landing and flying wires of 1/32 steel can be installed by soldering a washer on end sticking through plywood plates. Last, cover top of top wing and bottom of bottom wing and paint.

Finishing of the fuselage and landing gear follow, and the plane is about built. As a heavy paint job was to be used, gas model Silkspar tissue covered the model. Silk is harder to apply, but worth it as it resists tears best.

The Ohlsson .19 has same head width as topwidth of balsa shaped cowl and a piece of 1/8 sheet balsa was cemented to each side to prevent motor showing on the sides.

Finally, in rigging—the lead wires were made to slant back, in plan form, from the bellcrank about 1/4" at the guide mounted on wing struts. This, with about 1/2" right rudder, keeps the nose pointing out.

With the Ohlsson .19, assembled model was slightly nose heavy and a 16 (eight black, eight yellow) coat sprayed Testors paint job on fuselage and tail brought the tail to balance ship about 1/4" ahead the bellcrank bolt. This worked out as shown in test flying. If your model still is nose heavy, add weight in rear end to get the proper bal-

ance. Do not let the balance fall any further back, it could be as much as 3/4" forward of bolt and should be in that 1/4 to 3/4" space ahead of bolt.

The C. G. being ahead of the bellcrank bolt points the ships nose out, keeping flying wires taut. Thus you can see how a ship balanced any further back may lose control; balanced too far forward it will be nose heavy and impossible to land without nosing over.

In conclusion the Great Lakes Trainer kit has a minimum of criticism—namely beefing up the top wing center struts—but this is overlooked in the end result—a flying scale that flies—and flies—and flies!

World's Top Rubber Job

(Continued from page 12)

free from turbulence. Otherwise the results can be badly wrong. The pressure distributions around three airfoils, believed to be good for model airplanes, were calculated theoretically and then measured in the tunnel. The results are not yet published but I hope they will be soon. However my airfoil is developed following experiences from these tests. I think it is a good all round section for Wakefield models.

The stabilizer section is a modified Clark Y with six percent of chord maximum thickness. This section is not as critical as that of the wing because it is working at a relatively low angle of attack. You can probably use any normal airfoil section with good results.

Another very interesting question that arises since the new rules came in force is: which is the best stabilizer area? As you know the rules state a maximum total area of wing and stabilizer together. For static stability reasons you can use any stabilizer area, as long as you have freedom to move the wing relative to the c.g. But you need also good damping in pitch and that means a fairly large stabilizer area, especially if the moment of inertia is high as on most rubber-driven models. The stab area of my

(Continued on page 44)

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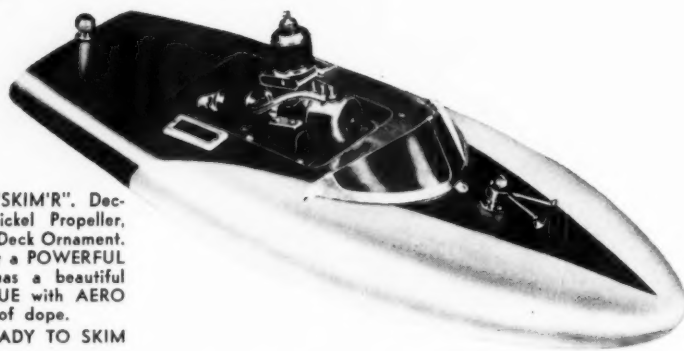
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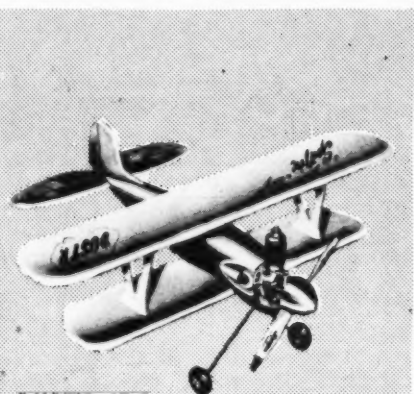
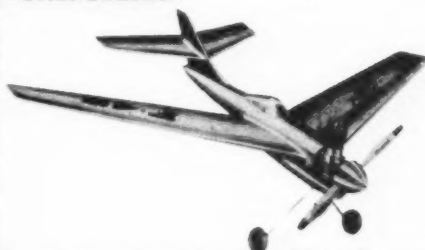
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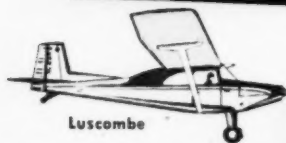
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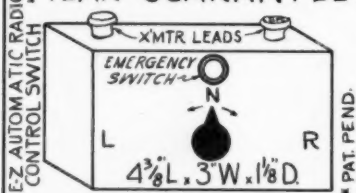
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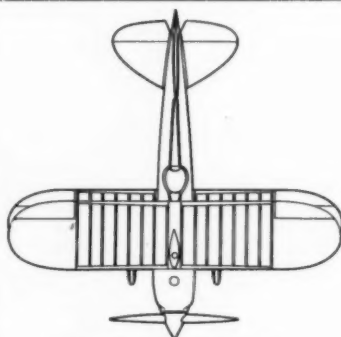
model is about 30 percent of the wing area, which is surely enough because the dynamic stability seems very good.

The problem of developing the best propeller to a given rubber motor and model is certainly a very difficult job. My propeller has a diameter of 48 cm and a pitch of 62 cm. It works fairly well but I am sure it is possible to make it better, perhaps by increasing the pitch. As yet I have not tried it. The propeller is freewheeling in the glide. I like that system but, as I have never tried a folder, I cannot judge which is the best.

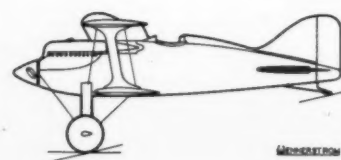
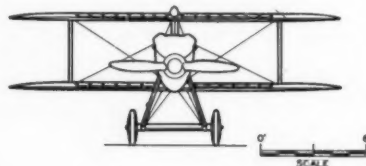
The model is trimmed by moving the wing relative to the fuselage varying the tailplane setting and offsetting the propeller-axis. The most important problem is to determine the wing position. In order to get the stabilizer carrying much load, it is desirable with a forward wing position. But a forward movement of the wing is followed by reduced longitudinal stability. Thus the most forward position is determined by the least acceptable stability. You must be sure that the stability is good enough not only for the glide but also for high power motor run. The model can very well have a stable glide but be unstable when the motor runs. Especially is starting from ground with full power critical. To begin with, try a wing position with middle point chord right above the c.g. and trim for best glide by varying the angle between wing and stabilizer chord. Varying this angle does not primary affect the stability. However, it is often convenient to move the wing when making small adjustments but be very careful when moving it forward.

The construction of the model is plain enough and need perhaps no explanation. I will only make a few annotations.

The corners of the fuselage should be well rounded off after construction. The landing gear is fixed in the fuselage. The only disadvantage is possibly trouble with packing. You can of course easily make it removable. The inspection cover is used for fitting the gears and rubber. It may be necessary to rub off the longerons inside to be able to put in the gears. The cover is fastened with cellulose tape. The stabilizer section is made by hand with sandpaper after construction. I have called the section modified Clark Y only because the lower side is a straight line. The nose radius is much less than that of Clark Y. The wing and tailplane are fixed to the fuselage with rubber bands as can be seen from the pictures.



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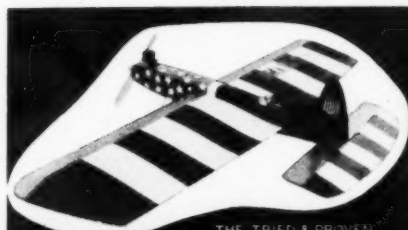
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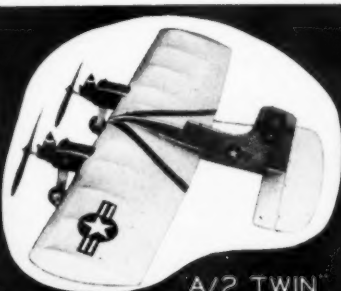


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AMA News

(Continued from page 24)

the '52 Nationals are the same as those charged for the past several years—\$1.00 basic entry fee plus 50c for each event entered. In addition, for entries postmarked later than midnight, July 15th, there will be a late entry fee of \$1.00 charged.

Male contestants will be housed at U.S.N.A.S. Los Alamitos, if desired, at a nominal cost. Quarters aboard the base will be available Sunday, July 27th.

Both male and female contestants will be furnished meals at a total cost of about \$1.20 per day for three meals at the station.

As this was written, plans were to mail each AMA member an application for entry in the Nationals. If these plans go through, and we hope they will, the entry blank will be in your hands before this is read. If not, or if you have moved recently, you cannot receive a blank unless you request it. Write today to AMA for one. The address: 1025 Connecticut Ave., N.W., Washington 6, D. C.

AA FREE FLIGHT FLYING SCALE EVENT. The following rules apply to the AA Free Flight Flying Scale event to be held at the Nationals. A detailed point system is being developed by the Nationals' AA Scale Committee and will be made available as soon as possible. In the meantime, the following will be helpful to potential entrants. No changes will be made which will affect any model built to conform to these rules.

- 1—Open to flying scale models powered by one or more engines of .000 to .050 cu. in. displacement each.
- 2—Fidelity to scale and workmanship points will constitute approximately 70 per cent of the total possible score. The remaining 30 per cent will consist of flight points.
- 3—Five minute limit on flight time.
- 4—Maximum of one minute for engine run.
- 5—Flight points will be awarded on basis of ratio of flight time to engine run, using best single flight.
- 6—Six attempts will be allowed to make three official flights.

7—A flight of ten seconds or over is counted as official.

8—At least one official flight will be required to qualify for awards.

9—Method of launching is optional. Bonus points will be awarded for unassisted R.O.G.

10—Scale three-view drawings must be submitted as required in AMA control line scale event rules.

11—Photos of prototype are advised to check details, color, markings, etc., where three-view drawings do not show these items.

12—Brief written description of any unusual details of construction is recommended.

JOHN BURTON TRANSFERRED. Late last March a group of AMA Leader members gave a farewell and a welcoming luncheon at the Wings Club, New York City, for Lt. Cmdr. John Burton, USN, who is being transferred to Tokyo, and Lt. Cmdr. Howard Eddy, USN, his replacement. Eddy takes over the job of head of the Youth and Education Branch of the Secretary of the Navy's Office of Information which Burton has handled so well for the past several years.

SOUTHEASTERN CONTEST. Plans are all set for a bigger and better 14th Annual Southeastern Model Airplane Contest to be held at Atlanta, Ga., on June 14 and 15. Scale builders will be glad to know that two separate events will be held for their favorite type of model, one for scale only and the other for stunt-scale.

The Arthur Godfrey perpetual trophy, presented for the first time last year at the Southeastern, has stirred a great deal of interest among the modelers in the deep south. Last year the winner was chosen from among the stunt and scale contestants. This year the trophy will be presented to the top gas or jet speed man. In 1953 it will go to free flight gas and radio control and the following year it will go to rubber and glider. Object of the award is to encourage and reward the outstanding modeler in AMA District V (S.C., Ga., Fla., Ala., Miss., & Tenn.) for his progress and performance in the year preceding the awarding for his faithfulness in attending meets in District

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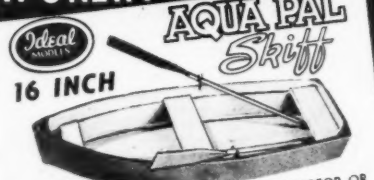
Write to Bob Elliott, Box 5078, Atlanta 2, Ga., for information about the Southeastern contest and Arthur Godfrey trophy.

CONTESTS

JUNE

- 1—Cleveland, Ohio, (Also May 31) Class AA First Annual AA Free Flight Flying Scale Contest. John W. Grega, Contest Director, 10422 Gay Ave., Cleveland 5.
- 1—Boston, Mass. (Also May 31) Plymouth Dealers' of Greater Boston 6th Annual Contest for CL, CLS, combat, beauty, Navy Carrier, TR, FFG, PAA Load, PAA Clipper Cargo, RC, Glider, and OR. John K. Ross, C.D., 23 Lantern Lane, Wellesley Hills 82, Mass.
- 1—Taft, Calif. Taft Record Trials for FFG. Francis Stewart, C.D., 900-21, Bakersfield, Calif.
- 1—Rochester, N. Y. Rochester Plymouth Control Line Meet. Ray C. Edmunds, C.D., 337 Genesee St., Rochester 11, Pending.
- 1—St. Louis, Mo. Class AA Thermaleers' Free Flight Meet for FFG, TLG, OR, PAA Load, and PAA Clipper Cargo. W. F. Netzeband, Jr., C.D., 913 Moreland, Glendale 22, Mo. Pending.
- 1—Newark, N. J. 6th Annual Essex County Model Plane Contest for CL, TR, and combat. Leon Shulman, C.D., 1314 Sunnyside Dr., Linden, N. J. Pending.
- 7-8—Kansas City, Mo. Class A Mid-West Wakefield Semi-Final Contest. Entry is restricted to those qualifying at Eliminations. S. E. Smith, Jr., C.D., 228 E. 32nd Terr., Kansas City 2.
- 7-8—Baltimore, Md. Class A Eastern Wakefield Semi-Final Contest. Entry is restricted to those qualifying at Eliminations. Pending.
- 7-8—Oklahoma City, Okla. Contest for FFG, PAA Load, TLG, OR, and OHLG. Ray Matthews, C.D., 3700 North Linn, Oklahoma City. Pending.
- 8—Lexington, Nebr. Class AA Nebraska State Stunt Contest. Donald R. Ross, C.D., Lexington.
- 8—Bethpage, L. I., N. Y. Class AAA Ltd. 7th Annual Mirror Model Flying Fair for CL, FFG, PAA Load, PAA Clipper Cargo, CLS, RC, combat, TR, and Navy Carrier events. Entry is restricted to first 1000 contestants entered.
- 8—Cape Girardeau, Mo. Class AAA Ill-Mo-Ky Control Line Contest for CL, combat, CLS, and CLFS. Ernest E. Miner, C.D., 541 So. Hanover St., Cape Girardeau.
- 8—Lorain, Ohio. Class AA Lorain Youth Center Jolly Rogers' Meet for CL and CLS. Ivan R. Bergman, C.D., 2214 W. 14th St., Lorain.
- 8—Carlisle, Pa. Class AA Team Racing and Combat Contest. Roy Williams, Jr., C.D., 525 S. Hanover St., Carlisle.
- 15—This is the deadline for completion of all Air Force Base Elimination Contests.
- 14-15—Atlanta, Ga. Class AAA 14th Annual Southeastern Model Airplane Contest. Contact R. H. Elliott, Box 5078, Atlanta 2, for information. Pending.
- 14-15—Salt Lake City, Utah. Class AA Salt Lake Active Modelers' Meet for CLS, CLFS, FFG, and CL. Norbert Baumgartner, C.D., 756 Parkway Ave., Salt Lake City 6.
- 14-15—Woonsocket, R. I. Class AAA Third Annual Flying Fair for OR, FFG, OHLG, TLG, CLS, TR, and CL. Thaddeus W. Wenclawik, C.D., 204 Lincoln St., Woonsocket.
- 15—Rockford, Ill. Class AA Rockford Model Contest for FFG, OR, and RC. H. E. Heminger, C.D., 836 Diamond Ct., Rockford.
- 15—St. Paul & Minneapolis, Minn. Class AAA Third Annual Talent Scout Model Airplane Contes for CL, CLS, FFG, OR, TLG, and combat. Paul J. Ring, C.D., 4150 29th Ave. S., Minneapolis 6.
- 15—Washington, D. C. Class AAA 7th Annual National Capital Model Air Show for FFG, CL, CLS, OR, TLG, beauty, and PAA Load. Write to Corr's, 818 (Continued on page 48)

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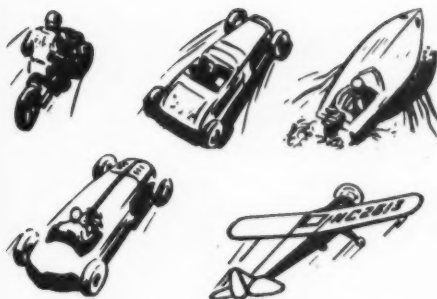
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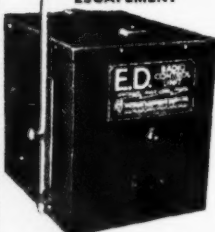
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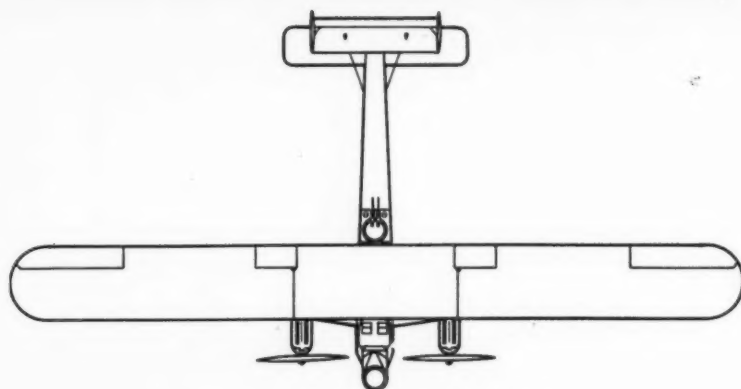
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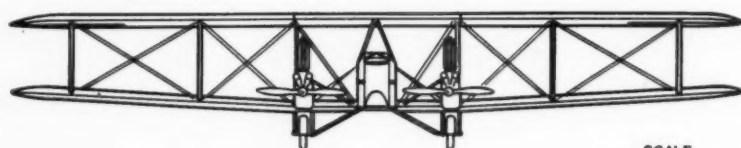
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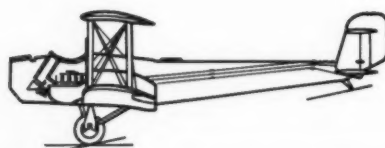


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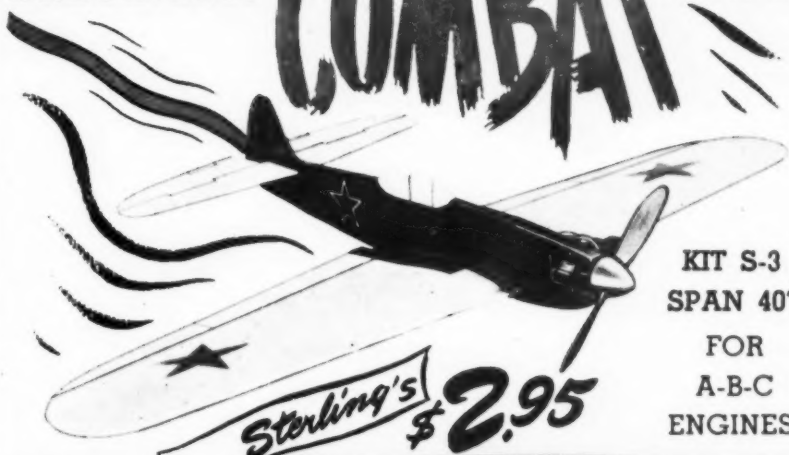
- Ninth St., N. W., Washington 1, for information.
- 15—Syracuse, N. Y. Class AA 3rd Annual Plymouth Model Plane Contest for CL, combat, CLFS, and CLS, Samuel R. Kalin, C.D., 1235 So. State St., Syracuse.
 - 15—McMinnville, Ore. Class AA Stardusters' Fifth Annual Free Flight Model Plane Contest for FFG, OR, and combined rubber-gas scale. Robert Kern, C.D., 1906 N. Portland Blvd., Portland 11, Ore.
 - 15—Elizabeth, N. J. Union County Plymouth Dealers' Meet for CL, CLS, and combat. Stanley B. Koch, C.D., 113 Brighton Ave., Perth Amboy, N. J. Pending.
 - 21—Idaho Falls, Idaho. Idaho Plymouth Dealers' Model Plane Contest. Jack H. Douglas, C.D., 133 East 2nd South St., Salt Lake City, Utah. Pending.
 - 21—Hartford, Conn. Class AAA Northern Connecticut Plymouth Dealers and Hartford Times Meet for OHLG, TLG, OR, FFG, CLFS, CLS, CL, and TR. Crosley Fitton, C.D., 398 Oakwood Ave., West Hartford. Pending.
 - 22—Lebanon, Pa. Class AA meet. Kenneth F. Carpenter, C.D., 751 N. Hanover St., Lebanon. Pending.
 - 22—Cedar Rapids, Iowa. Class AAA 7th Annual John Pavlis Memorial Model Airplane Contest for OHLG, TLG, FFG, PAA Load, CLS, CLFS, and RC. Paul M. Marchal, Jr., C.D., 1837 8th Ave., S.W., Cedar Rapids.
 - 22—Red Lodge, Mont. Class A Airscrews' Model Aircraft Meet for FFG, combat, CLS, TR, and CL. Entry is restricted to residents of Montana and northern Wyoming. Conrad J. Erck, C.D., Box 214, Red Lodge.
 - 22—Flint, Mich. Class AA Exchange Club Meet for FFG, OR, CL, CLS, and scale. R. J. Dear, C.D., 720 Harrison, Flint. Pending.
 - 22—Hicksville, L. I., N. Y. Class AA 6th Annual Screamin' Demons of Long Island Meet (Part One) for AA free flight flying scale, AA FFG, OR, and RC. Bob Buragas, C.D., 255 Laurel Ave., Arlington, N. J.

- 22—Ft. Wayne, Ind. Ft. Wayne Plymouth Dealers' Contest. Walter A. Krull, C.D., 414 E. Washington, Ft. Wayne. Pending.
- 28—This is the dead line for completion of all Air Force Command Championship Contests.
- 28-29—Detroit, Mich. Class AAA Michigan State Exchange Clubs' Model Airplane Meet for OR, FFG, PAA Load, CL, CLS, and RC. Entry is restricted to residents of Mich. and Windsor, Canada. F. P. Sposite, C.D., 9900 E. Jefferson, Detroit.
- 29—New York, N. Y. Class AAA Gas Monkeys' Fifth Annual Championship Contest for FFG and PAA Load. Ernest V. Roff, C.D., 56 Stuart Ave., Malverne, N. Y.
- 29—Midland, Mich. Midland Plymouth Model Plane Contest for TLG, OHLG, OR, CL, and combat. Truman DeVore, C.D., 4114 Elm Court, Midland. Pending.
- 29—Worcester, Mass. Worcester County Plymouth Model Plane Contest for CL and CLS. Alfred Dion, C.D., 23 Sunny Hill Dr., Worcester. Pending.

JULY

- 4—Anchorage, Alaska. Pending.
- 4—Peoria, Ill. Class AA Peoria Control Line Contest. Morgan Baldrige, C.D., 327 So. Washington St., Peoria 2. Pending.
- 6—Baltimore, Md. Class AAA Second Annual Greater Baltimore Model Airplane Championships for CL, CLS, beauty-scale, combat, TR, FFG, FF scale, OR, TLG, OHLG, RC, and PAA Load. Clayton Morgan, C.D., 3801 W. Saratoga St., Baltimore 29. Pending.
- 6—Terre Haute, Ind. Plymouth Dealers' Contest. Pending.
- 6 & 13—Salt Lake City, Utah. Plymouth Utah State Model Airplane Contest. Jack H. Douglas, C.D., 133 East 2nd South St., Salt Lake City. Pending.
- 9-15—Amarillo AFB, Texas. Air Force World Wide Model Airplane Championship Contest.
- 13—Minneapolis & St. Paul, Minn. Plymouth Meet. Pending.
- 13—Johnsville, Pa. Philadelphia Plymouth Dealers' Meet. Pending.
- 13—Joliet, Ill. Glen F. Stearman, C.D., 420 Landau Ave., Joliet. Pending.
- 13—Wilmington, N. C. Class AA 2nd Annual East Carolina Control Line Championships for CL, CLS, and CLFS. W. W. Peck, Jr., C.D., 214 Walnut St., Wilmington.
- 13—Fall River, Mass. Class AAA 6th Annual Plymouth Elimination Contest for CL, CLS, and CLFS. David P. Turner, C.D., 246 Oliver St., Fall River.
- 13—Charleston, W. Va. Plymouth Meet. Pending.
- 20—Falls Church, Va. Class AA Control Line Meet. Pending.
- 20—Allentown, Pa. Class A Allentown Plymouth Dealers' U-Control Meet for CL, CLS, CLFS, and TR. Entry is restricted to residents of PA. Wm. Pitt Hartzell, C.D., 335 Juniper St., Quakertown, Pa. Pending.
- 20—Greenfield, Mass. Class AA Meet. Pending.
- 27—Portageville, Mo. Class AAA Rotary-Plymouth Meet for CLS, CL, stunt-scale, and combat. W. C. Kroeger, C.D., Portageville.
- 27—Hagerstown, Md. Class AA Control Line Meet. John Young, C.D., Box 691, Hagerstown. Pending.
- 27 to August 3—Los Alamitos, Calif. Class AAAA National Model Airplane Championship Contest.
- Key to listing of events: FFG—Free Flight Gas; CL—Control Line Speed; OR—Outdoor Rubber; TLG—Towline Glider; IR—Indoor Rubber; OHLG—Outdoor Hand-Launched Glider; IHLG—Indoor Hand-Launched Glider; CLS—Control Line Precision (Stunt); CLFS—Control Line Flying Scale; RC—Radio Control; TR—Team Racing.
- Contests designated "Pending" mean the application is before the proper authorities as we go to press; "Record Trials" mean no prizes, but a chance at cracking the records; "Class A" is a meet with restricted entry; "Class AA" is a meet with unrestricted entry; "Class AAA" is a state-wide or regional meet; "Class AAAA" is a national or international meet.
- THE END

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ATWOOD MANUFACTURING CO. PICO, CALIF.

Planes in the News

(Continued from page 32)

nose and wing intakes.

Six .50-cal. machine guns (when, oh, when are we going to insist on cannon?) arm the F; four are in the nose, and one is in each wing root. The outside armament is lots heavier; 24 five-in. HVAR rockets adorn the wing racks, and four 1,000-lb. bombs can be carried. Or alternate loads of fuel and armament—including mixtures of 230-gal. drop tanks or two 1,000-lb. bombs or napalm bombs—can be carried. For really long range, the F will tote two 450-gal. tanks which lengthen combat radius to well over 1,000 mi.

No comment on performance, says Re public; but the F will be faster, fly farther and higher than the F-84E now in Korea. (This, by the way, should be fairly obvious. But they've got to say something for public consumption.)

The RF-84F has a brand-new nose forward of the windshield. It carries cameras—oblique and vertical picture types—in this new proboscis. And it, too, will carry the wing root intakes. On armament, a pair of fifties in each wing serve to offend the enemy.

Incidentally, some questions are always raised when a designer goes to wing inlets over other types. These questions generally have to do with the drag of such inlets. Maybe this is a good time to try to clear up any questions about the relative merits.

First of all, any type of inlet which is fairly far forward on the body of the airplane can be made to be efficient with careful design. So there really is no basic choice to make. In the case of the T-jet, the new Sapphire engines require more air than the Allison J35 now powering the plane. More air means a larger inlet, so there has got to be a change. Presumably the Republic design teams had their reasons for going to the wing inlet (I can guess that it has to do with armament systems), but by careful selection of the contours of those inlets, they were able to keep the drag down. Why?

Well, one factor that increases drag is wing thickness. The thicker the wing, the higher the drag. This is because the air has to be shoved aside a greater distance with a thick wing than a thin one, and it takes more work, or increases the drag—to do this. But with a big wing root inlet, some—in fact, most—of the air that used to have to detour around the thick section gets swallowed up and comes out in the engine. There's only a little bit of the air left to go around, and it doesn't have to travel far. So the work done on that air, which is equivalent in some ways to the drag of that portion of the airplane, is decreased. As a matter of fact, it is possible to get lower

wing drag with wing root inlets because of this phenomenon.

► **Behemoth Battle**—Boeing's eight-jet B-52 made its first flight from Seattle to Moses Lake, Wash., just a couple of days after the Dept. of Defense made the official release of its opposite number, the Convair B-60. Both these craft are vying for production orders; both are powered by eight Pratt & Whitney J57 turbojets; both are under heavy security wraps.

Security—this means that everybody within earshot of Boeing's field has been rushing to the windows every time the characteristic roar of jet engines shatters the quiet of Puget Sound. And they stand with noses pressed to the pane or stuck through the fence at the end of the runway and watch the B-52 go through taxi tests. The British magazines *FLIGHT* and *THE AEROPLANE* have both reported on the big job. But you can't see it; unless you want to go to Seattle. And if you were a spy, you would.

Security—that means that at Convair's Ft. Worth plant, all 32,000 employees plus about 12,000 more across the field at Carswell AFB saw the big boy when he was rolled out for the first time. They all had a chance to note the landing gear (said to be like the B-36 but blacked out of the photos for some reason) and the details of the plane. And they saw it from many more than the one angle the public saw in the lone picture released of the airplane. You could see this one, too, if you wanted to go to Ft. Worth. And if you were a spy, you would.

While I'm on security, let me digress a minute more. I would bet that the military of every prospective enemy country (name one) has the complete pitch on these planes.

Furthermore, in this country we have lots of dope on the MiG. The Russians know how to build the MiG; the Russians know we've got information on the ship. From whom are we keeping the secret of how the Russians build the MiG?

► **MiG Forerunner?**—Speaking of the MiG—as everybody is now—the Martin people say that their Hans Multhopp, head of the New Design section, designed a plane in 1944 which has been regarded by some experts as the forerunner of the MiG. Expert or not, I am definitely not in the "some" referred to. To me, there is precious little resemblance between the MiG-15 and the Ta-183, Multhopp's job. As a matter of fact, about the only thing the two planes have in common is that they are jet fighters.

Multhopp is a very smart designer and needs no professional introduction to any aeronautical engineer who has studied the many projects that came from Focke-Wulf during the recent unpleasantness. Multhopp was one of a few German designers whose name was fairly well known in this country before the war.

Moreover, this kind of talk adds to the general faulty impression that the Russian weapons are copied or developed from the Germans or the U.S. or the English. It ignores the fact that the Russians are smart engineers in their own right, that they have been making new contributions to aeronautical research for many years, and that they design good, original aircraft.

We made the same mistake with the Japanese in the last war, and got the everlastin' kicked out of us for a while by the Zeros. You will recall that everybody in the United States was either accused of selling the original design to the Japanese or credited with designing the plane that the Japanese copied to make the Zero. And long after the war had ended, we found that there were smart engineers in Japan, that they had designed the Zero with no outside help or aircraft to copy, and that they had lots of other projects in the mill which were original and better.

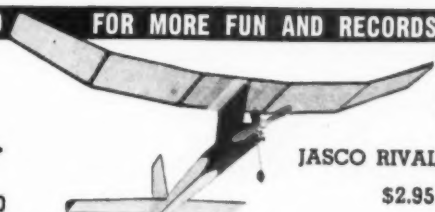
So respect Multhopp because he is a brilliant engineer, not because of any poorly based claim that he designed the forerunner of the MiG.

► **Ramjet Research**—Over in France, work is continuing behind a curtain of secrecy on the fourth Leduc ramjet-powered research plane. As far as I know, this craft is absolutely unique—it is the only man-carrying,

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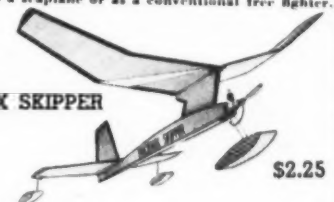
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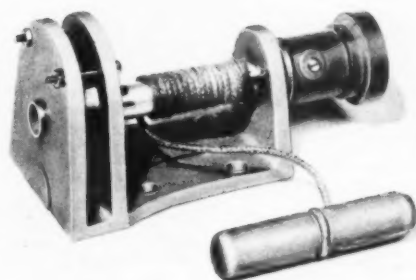
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The fourth craft is the Model 021; it differs from earlier versions in the mounting of two Turbomeca Marbore II jet engines at the wingtips. Thus the 021 can take off under its own power. It carries fuel for about 45 min., and can touch the ceiling at about 50,000 ft. Its performance is subsonic.

Rene Leduc has been developing ramjets since 1933; in an unsung way he has made a tremendous contribution to the design and engineering of future types of aircraft. His prototype progress has been logical and what the British call orderly.

And a real need exists in France for this type of plane, because the ramjet jobs are naturals for interception. They also should cost lots less because they eliminate completely the multi-bladed, finely machined



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turbojet engine as a main powerplant. Instead, they light a bonfire in a stovepipe and take off.

No dimensional data have been made available for this fourth plane, but it has been reported that the inlet diameter of the ramjet itself is 8 ft. If this is true, the whole machine must have grown considerably; the earlier versions had a diameter which I should judge to be about 4 ft.

► **Bits and Pieces**—You'll remember the Marcel Dassault MD-450 Ouragan which was drawn and written about in MAN for April 1951. The French firm is currently flying the MD-450-30L, and aerodynamic prototype for the two-seat MD-453 all-weather fighter. Main difference between the two planes is in the use of cheek engine air inlets alongside the cockpit instead of in the nose. And of course, the 30-L has two places instead of one. . . . Grumman's XF10F-1 Jaguar, gigantic fighter with variable-sweep wings, should be under flight test wraps at Edwards AFB, Calif., by now. . . . First air delivery of F-84 Thunderjets occurred Mar. 24, when three of Republic's famed fighter-bombers were ferried to France by pilots of the Military Air Transport Service. Trip was without escort; stops were Labrador, Iceland, Greenland and Scotland. . . . And Republic made headlines again when an F-84G Thunderjet stayed aloft for 12 hr. and 5 min. with refueling from a Boeing KB-29P tanker. . . . Biggest effort behind the commercial jet transport in the United States is at Lockheed. During the last two years, about half a million has been spent by the firm on windtunnel tests, aerodynamic and structural studies for the plane. . . . The YH-21 helicopter, Piasecki's latest, took the air for the first time recently. Grossing more than 13,000 lb., the 'copter is powered by the nine-cylinder Wright R-1820-103 which develops 1,150 hp. for take-off. . . . The two new British night fighters—De Havilland's 110 and Gloster's GA-5—will be ordered in quantity. RAF had only ordered six of each for comparison trials, and now in a reversal of policy, has decided to blow the roll. If there is an inside track, the De H job has it. It's said to be simpler to build because it's more conventional than the delta-winged Gloster job.

Fokker Triplane

(Continued from page 25)

celebrated the event by shooting down a British R. E. 8. This was his 60th victory. He downed his 61st plane, a Sopwith Pup, the next day. Von Richtofen said he liked the Tripe: that was a real stamp of approval. The Fokker factories ground out Triplanes like sausage. Within a week, half of Richtofen's squadron, Jagdstaffel 11, was outfitted with them. So excellent a ship went to the top men first.

Mechanics of Richtofen's Staffel, and ground crews of the lucky Jagdstaffels, soon fell in love with the Triplane. At first they looked with some misgivings at the strange little ship that had three wings, was nearly as tall as it was long, had very thick wings and no wires. But those mechanics whose pilots were lucky enough—or good enough in the air—to rate a Tripe found the plane easier to maintain than anything that bore the Black Cross.

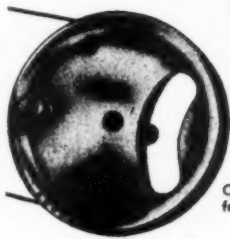
Ground crews found in the Fokker Dr.I, as it was officially designated, an attempt of the old master fighter designer, Anthony Fokker, to produce a ship that would be invincible in the five or ten minutes of dog-fighting that determined the outcome of a W. W. I air battle. He theorized that it did not matter how long it took a plane to get to the fight, or to get home; what it could do in battle was the important thing.

So he designed the Dr.I small, light, maneuverable and with an intentionally short range. Its three wings were of the same thick airfoil section and chord, except where the two balanced ailerons of the upper wing protruded beyond the trailing edge. Upper wing spanned 22' 2", not including aileron balance overhang; middle wing spanned 20' 4-1/2", and lower, 18' 6-1/2". They were all made in one piece, of solid plywood ribs

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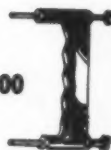
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mounted on a single box type main spar of unusually large cross section. Trailing edges were wire, leading edges plywood. Ailerons were framed in steel tubing.

Single, broad interplane struts attached between the three wings on each side served more as tie-bars than true structural members intended to help distribute the flight loads. In its original form, the ship was demonstrated before procurement officers without struts. They would not accept the ship until Fokker put something between the wings that looked like bracing. Except in the center section, Triplane wings were devoid of external wiring. This fact made the ship a joy to rig and maintain.

While the wings were almost entirely of wood construction, the fuselage followed Fokker's practice of using steel tubing. The four longerons and connecting members were torch welded to form a boxlike framework. Strut bays were braced with steel wire held taut by turnbuckles.

Fabric covered, except for a curved aluminum upper fuselage deck in front of the pilot and a plywood base fairing on each side aft of the engine cowl, the body was otherwise flat on the sides and bottom. An Oberursel 110 hp engine, produced in Germany under license on the French Le Rhone rotary design, was neatly covered by an open front and bottom aluminum cowl. Fokker chose this powerplant, in the face of rising horsepowers used by other manufacturers, both German and Allied, for two reasons. First, it was light, economical and served the power requirements for the Triplane. Second, he owned a controlling interest in the Oberursel company and thus had a dependable source for engines.

Tail assembly of the Fokker Dr.I was framed in steel tube and fabric covered. The elevator, and the one-piece, "comma" shaped rudder, were balanced. There was no vertical fin. Landing gear was built up of steel tube struts and an axle encased in a low aspect ratio airfoil between the wheels.

If the Tripe was liked by the mechanics for its ease of maintenance on the ground, the men who flew it were justified in expressing their fondness for it in the air. It was the only plane Manfred von Richthofen openly expressed a liking for.

The Fokker Dr.I was credited with a sea level top speed of only 115 mph, but its outstanding rate of climb, 3,300 ft. in less than two minutes and 16,500 ft. in 14 minutes, was one of its greatest assets. Its ability to literally turn on a dime and to maintain its extreme maneuverability at high altitudes made it a favorite with German pilots and a nuisance to the Allies. Its lightness on the controls and short endurance—1 1/2 hours—made it a pleasant ship to fly from the pilot fatigue standpoint. Small or rough front line fields were no problem for Fokker Dr.I operation, considering the plane's slow, 30 mph power-off landing speed. Its very high stalling angle permitted it to land even more slowly with power, and in a stalled condition. The ship could normally take off after a 100 foot ground run, and stopped in even less distance after touch down. All things considered, the Fokker Dr.I was an excellent defensive weapon and, had such a classification existed in its day, it could have qualified as an interceptor.

Use of the Fokker Tripe as an offensive weapon was a mistake that cost the Germans the lives of several of their most outstanding aces. Still suffering from his scalp wound, von Richthofen obtained an extended leave after his 61st victory. He had hardly settled down to his favorite sport of elk hunting when he received word that Lt. Walter Hohendorf, one of the original Boelcke group which had cut its battle teeth on Fokker Eindeckers, had been shot down over Polygon Wood in a Triplane.

Hohendorf, although credited with only 12 victories, was something of a national hero, having actually wormed his way into the French air service before the war as a spy. His escape, when discovered, reads like fiction. Later he had been outstanding as a fighter pilot instructor.

Funeral services for Hohendorf were hardly concluded when, on September 15, Lt.-

Col. Kurt Wolff, was shot down in flames. Wolff was acting as commanding officer of von Richthofen's squadron in his absence, and was credited with 33 victories. His rank of course rated him the Tripe which proved to be his funeral pyre.

Eight days later, misuse of the Fokker Triplane cost the life of Lt. Werner Voss after he had put on what is considered the greatest Fokker Dr.I fight on record. Flying alone, Voss ran into three flights of British planes, Bristol Fighters on top, S. E. 5's in the middle and Camels on the bottom.

Considering the element of surprise on his side, he lunged into the middle flight of S. E. 5's. Passing through without a hit, and noticing that the British completely ignored him, he saw that the British could not attack him without breaking formation. Doubling back, Voss made a head-on pass at the S. E. 5's. He didn't know, and probably wouldn't have cared anyway, that he had barged into the famous High Hat squadron, and that in this flight were such noted British aces as McCudden, Maxwell, Bowman and Rhys-Davids.

But they knew who Voss was by his tell-tale checkerboard insignia. The High Hats broke formation and went after him. For nearly 10 minutes Voss bounced around like a feather in a breeze, finally pulled off and put his Tripe through a series of stunts as though taunting them for their inability to corner him. Noting a flight of Albatros D.V.'s coming into view above, Voss zoomed up to them, signaled for attack, and again dove on the English formation, thinking the Albatros would follow him in. Instead, they took one look at the High Hats and turned tail. Disgusted, Voss nevertheless plunged single handed into the High Hats. He went to his death with 48 victories to his credit, but it took the best pilots on the British front to beat him.

Werner Voss' confidence in his Dr.I probably is understandable; he had scored one victory a day for 21 consecutive days with it!

Lt. Gonterman, Germany's greatest "balloon buster," with 39 victories and Lt. Erwin Boehme, 21 victories and commander of Jagdstaffel 2, went next. On von Richthofen's return to the front in mid-November, he changed his tactics, went on the defense. That he was right is attested by his personal score on the Tripe. Poor flying weather prevented much activity, until March 12, 1918, when he scored his 64th victory. The remaining 16 of his total score of 80 were made between that date and April 21, when he went down under the guns of Capt. Roy Brown.

Shortly after von Richthofen's death, the Triplane was put on the retired list, although used at the front. The famed Fokker D.VII was coming up to replace it.

Except for two examples which found their way into German museums (one in Munich, and one in Pottsdam, now in the Russian Zone) the Fokker Triplane became a weapon of the past at war's end.

The total production of 150 Fokker Triplanes accounted for approximately 320 victories gained with the type.

M. A. N. at Work

(Continued from page 8)

place this month is due to our finally having scissored the phone wires after dropping a clumsy clue that we had left for the Tibetan Nationals. Between paragraphs, for the past three days, have talked with folks who want to build their own jet engines (go buy a Dynajet), make a movie for one of the big studios, do a story for Voice of America, or edify you readers with the world's greatest models. The reaction entails looking out the window at a beautiful blue sky and sagging flags, and inspecting the progress of a skyscraper foundation next door. The June issue is with the printer, type for July is being set (this is April 17, by the way), layout material is gathering for August, and the pipelines are filled with designs of all shapes and forms for issues past Christmas. Don't ask us what time it is. This is M.A.N. at Work. The "Pro." THE END

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Features "Autotrol" rudder operation, eliminating slack control lines in critical maneuvers.



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North American "T-28"

30" Wingspan—For .23 to .36 Engines

This new Air Force trainer makes a perfect stunt-scale design. Tricycle gear, pre-fab.



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Republic "P-47 THUNDERBOLT"

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Engine throttle control, fully automatic wing flaps, shear-pin mounts and die-cut parts.



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North American "P-51 MUSTANG"

37" Wingspan—For .19 to .36 Engines

Features retractable-extensible landing gear, throttle, flap, elevator and rudder control.



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This 1 $\frac{1}{2}$ " scale Goodyear racer features "Step Keel" construction. Meets Team Racing rules.



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This beautiful 1" scale control-line lightplane kit is pre-fabricated. Features "Step Keel."



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- Super-Aerotrol has been tested under the Academy of Model Aeronautics special license in various parts of the country for nearly a full year. In addition "Super-Aerotrol" has been sent to England for tests on their license-free band. Here is what the experts say:

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WARREN BARTLETT—test flying Super-Aerotrol on Academy of Model Aeronautics special license KG2XA says:

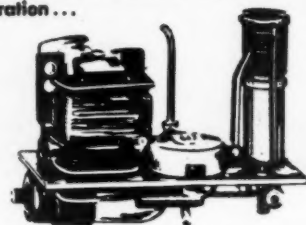
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- NEW super-sensitive relay.
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Kit includes: Finished, tested sensitive relay; finished dust-core tuner; drilled bakelite base with condensers and eyelets attached; all electrical components, condensers, resistors, coils, chokes and potentiometer; all necessary contacts, and color-coded wiring. Can be assembled in less than two hours. Complete building and operating instructions are included.

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- Operates on 27.355 mc.
- Completely portable—Self contained—No separate antenna—No external Batteries!
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Kit includes all necessary parts (except tube and batteries): Precision Ground Crystal; Painted Metal Cabinet; Finished Sectional Antenna; stamped and formed chassis with all holes punched; all necessary components, resistors, condensers, coils and chokes; color coded wiring. Can be assembled in less than two hours. Complete building and operating instructions are included—

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BRIGADIER "R. C.-38"

For .035 to .099 Engines—38" Wingspan

This completely re-designed "1/2 A-A" Free-Flight may be flown as a Radio Control job, a PAA-Load model, or a free-flight Sport Flyer. Plans include Radio Control and PAA-Load installation details. The kit is pre-fabricated with formed gear, die-cut balsa and plywood parts, hardware and notched trailing edges.

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For .23 to .36 Engines—56" Wingspan

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For .45 to .65 Engines—72" Wingspan

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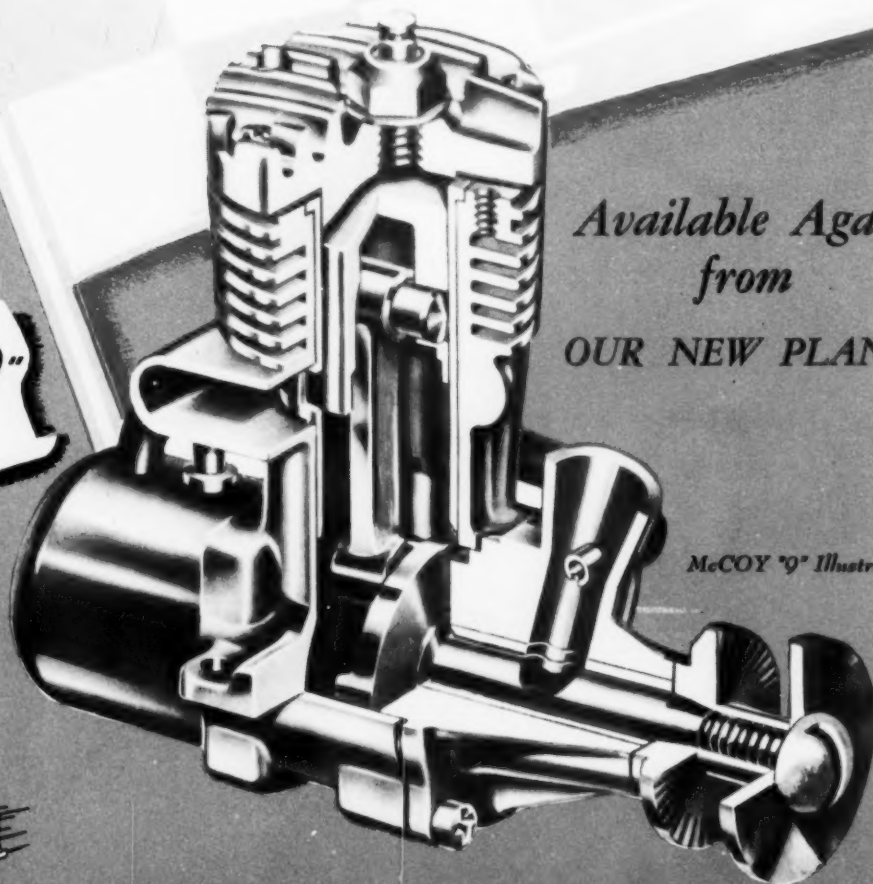
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